

COMMITTEE WORKSHOP
BEFORE THE
CALIFORNIA ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of:)
)
The Preparation of the 2005) Docket No.
Integrated Energy Policy) 04-IEP-01-A
Report)
)

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
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9:12 A.M.

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COMMISSIONERS PRESENT

John L. Geesman, Presiding Member

James D. Boyd, Associate Member

Jackalyne Pfannenstiel, Commissioner

ADVISORS

STAFF PRESENT

Daniel W. Fong, P.E.
Transportation Technology Specialist

Gerry Bemis

ALSO PRESENT

Capt. Jim Muldoon, USAF

John Boesel, President and CEO
CALSTART

Cynthia Verdugo-Peralta, Governing Board Member
South Coast Air Quality Management District

Paul Wuebben, Clean Fuels Officer
South Coast Air Quality Management District

Tom Koehler
CRFP

David Modisette, Executive Director
CETC

Andy Frank, UC Davis

Randall J. von Wedel, Ph.D., President and
Director of Research,
Cyto Culture Environmental Biotechnology

ALSO PRESENT (Continued)

R. Edward Burton
EBC Company

Shannon F. Baxter, Ph.D.
Special Advisor on Hydrogen and
Renewable Energy Programs
CEPA

Jon Van Bogart
Clean Fuel USA

Michael Eaves, President
California Natural Gas Vehicle Coalition

Edward Kjaer, Director, Electric Transportation
Southern California Edison

Gordon R. Garry, Director of Research and Analysis
Sacramento Area Council of Governments

Jamie Levin, AC Transit

Reza Navai, Ph.D., Chief
Office of Policy Analysis and Research

Ben Ovshinsky, West Coast Representative
Energy Conversion Devices, Inc.

J. Steve Welstand, Consulting Engineer
ChevronTexaco

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P R O C E E D I N G S

9:12 a.m.

PRESIDING MEMBER GEESMAN: I'm John

Geesman, the Commission's Presiding Member of its 2005 Integrated Energy Policy Report. To my right is Commissioner Jim Boyd, the Associate Member of the Integrated Energy Policy Report Committee and the Presiding Member of the Commission's Transportation Fuels Committee. To my left is Commissioner Jackalyne Pfannenstiel, the Associate Member of the Commission's Transportation Fuels Committee.

This is a workshop on proposed transportation energy efficiency, alternative fuels, and VMT reduction analyses that will form the scope of the analysis that our staff conducts for the 2005 cycle of our Energy Report.

I suspect it will carry forward the analysis done for our 2003 Integrated Energy Policy Report and the analysis that we performed in conjunction with the California Air Resources Board in response to AB2076 Report that the Commission had opted in the summer of 2003.

We are the most mobile society I suspect in the history of the world. We have had the

1 benefit of that mobility in California for a long
2 time. Increasingly we bear the burden of that
3 mobility. Since 1988, our state has become a net
4 importer of refined transportation fuels,
5 primarily petroleum based, and we are increasingly
6 seeing both the environmental and economic
7 consequences of that shift.

8 Our efforts have been focused on ways in
9 which to displace that petroleum both through
10 improvements and efficiency and the development of
11 alternative fuels. Today's workshop is intended
12 to establish the scope of the analyses that we
13 will be doing over the course of the 2005 cycle.
14 All envisioned to end up in adoption of a final
15 set of policy recommendations by the Commission in
16 November of 2005.

17 Commissioner Boyd.

18 COMMISSIONER BOYD: Thank you,
19 Commissioner Geesman. I think you pretty well
20 covered everything. Just to reinforce a couple of
21 your points, what we are desiring to look at in
22 order to address this continuing dilemma of the
23 propensity of Californians to make such heavy
24 demands on transportation that we cannot seemingly
25 adequately meet the energy needs for that

1 transportation, i.e. the uses of fuels in
2 transportation vehicles, and our basic fuel source
3 is conventional fuel, i.e. petroleum.

4 Therefore, in our 2076 analysis as it is
5 called and in the Integrated Energy Policy Report
6 of 2003, we pointed out that energy area needed
7 efficiency actions and activities just like the
8 other energy supply areas, electricity and natural
9 gas. So, as you have indicated, we are interested
10 in what can be done with regard to energy
11 efficiency through alternative technologies and
12 other measures. In addition, as indicated, what
13 alternative fuels are there to try to meet this
14 ever growing demand. We have for years dealt with
15 the continuous expansion of vehicle miles traveled
16 by the California population as the population
17 grows.

18 I, too, look forward to some innovative
19 good ideas in this arena. Thank you.

20 MR. FONG: Thank you Commissioners
21 Geesman and Boyd. I'd like to remind people in
22 the audience who wish to speak to fill out one of
23 the blue cards which is on the table in the entry
24 way. We will use those cards to call upon you
25 when we open up the floor to general comments.

1 We also have a list of speakers who have
2 previously indicated a desire to speak, and so our
3 Commissioners will be calling on those individuals
4 first before they go to the blue cards that are
5 submitted to them.

6 For the record, my name is Dan Fong. I
7 will serve as the lead analyst for the
8 transportation elements of this addition of the
9 2005 Energy Report.

10 Those of you who have questions or want
11 to submit information should contact me. My e-
12 mail address was on the workshop notice, probably
13 also on the Commission's phone directory if you
14 want to contact me in that mode.

15 This morning I will go through a brief
16 overview of the planned analysis that we propose
17 for transportation energy related issues.

18 I'll say a little bit about the
19 background of this analysis, touching upon some of
20 our work that we did in support of the 2003 Energy
21 Report.

22 I will say a little bit about the goals
23 of the current analysis, the methodology we
24 propose to use, some of the options that we
25 believe merit updating or inclusion in this Energy

1 Report, and then some administrative information
2 about how to go about submitting comments to the
3 Staff and to the Commission.

4 Previously the Energy Commission
5 produced a report titled "Reducing the State's
6 Petroleum Dependence". This was done in response
7 to legislation AB2076. Concurrent with that
8 effort, the Commission was working on the 2003
9 Energy Report. We essentially used much of the
10 analysis that we did for 2076 and incorporated
11 that as part of the Energy Report.

12 We made some significant recommendations
13 to reduce the State's overall demand of petroleum
14 fuels in the 2020-2030 time frame. We also
15 recommended that we begin to diversify our energy
16 mix and begin to employ an increasing amount of
17 non-petroleum-based fuels and technologies.

18 For this particular analysis, we again
19 want to determine the merit of options to reduce
20 California's transportation energy demand.

21 We certainly also invite broad
22 participation of interested parties to help us
23 identify those options and to conduct assessments
24 of their value as part of the technical work that
25 we eventually want to publish and present to the

1 Commission.

2 The methodology that we propose to use
3 is essentially a cost and benefit comparison. We
4 will evaluate options to increase efficiency and
5 use alternative fuels as compared to reference
6 scenarios.

7 Those reference scenarios are being
8 developed by our transportation energy demand
9 staff. Those referenced scenarios are also called
10 "business as usual" cases.

11 We hope to evaluate incremental costs
12 and benefits of those options to reduce
13 transportation energy demand.

14 The reference scenarios are being
15 produced by a computer model, which we call
16 CalCars, it is a consumer choice model.

17 From this analysis, we hope to determine
18 net benefits over the time period of the 2005
19 Energy Report which is from 2005 to 2025.

20 The net benefits in our methodology
21 include direct environmental and non-environmental
22 elements and well as external costs of petroleum
23 dependency.

24 The environmental elements will be
25 updated as needed by ARB staff, and I need to make

1 a slight correction to that statement. ARB staff
2 will be using work that they have already
3 completed that might be used to update various
4 elements of the environmental portions of our
5 work. They, however, are not proposing
6 necessarily to do new work that they have not
7 already completed.

8 The results that we will project will be
9 based upon a range of fuel prices, rebound
10 effects, and discounting of future costs and
11 benefits.

12 In the efficiency area, here is a list
13 of some of the key efficiency options that we
14 believe we should be including in our analysis.

15 The first bullet is improve vehicle fuel
16 economy. We will look at a variety of scenarios
17 and based upon different levels of fuel
18 improvement, we will run some cases trying to
19 measure based upon revised petroleum fuel
20 forecasts what looks good to the buying public.

21 One of the significant near-term
22 measures that we believe merits analysis is fuel
23 efficient replacement tires. The Commission is
24 beginning to initiate a test project that we hope
25 will give us new data to reevaluate this

1 particular efficiency option.

2 We also have pursued in the past
3 examination of improve vehicle maintenance
4 practices that will either maintain or improve the
5 efficiency of existing vehicles on the road.

6 We would also like to further evaluate
7 the possibility of all government fleets based
8 here in California using best in class purchasing
9 practices to emphasize fuel efficiency.

10 We are also looking on the heavy duty
11 side on the option of more efficient heavy duty
12 engines for trucks.

13 A relatively new petroleum reduction
14 option that emerged near the end of our original
15 work for the 2003 Energy Report is truck stop
16 electrification. Some of you may have recently
17 heard about this on NPR.

18 The last efficiency option which we
19 believe merits some consideration is low viscosity
20 lubricating oils.

21 PRESIDING MEMBER GEESMAN: Is there a
22 reason why you don't include private fleets in
23 your analysis?

24 MR. FONG: The private fleets will be
25 evaluated under improved vehicle fuel economy. We

1 would look at the fleet at large for that
2 particular case. We are not, though, emphasizing
3 like car rental fleets in specific way.

4 PRESIDING MEMBER GEESMAN: Is there a
5 reason for that?

6 MR. FONG: Probably just a lack of our
7 own thought process, but certainly I think we can
8 include that in some fashion.

9 PRESIDING MEMBER GEESMAN: I know in the
10 wake of Supreme Court decision relating to the
11 South Coast's efforts in this regard, there is a
12 fair body of thought that if included in the state
13 implementation plan, that regulatory authority
14 could be extended to include private fleets, and
15 it would occur to me that depending on what level
16 of urgency we attach to this area, that may be a
17 viable policy option for this state.

18 MR. FONG: Correct.

19 PRESIDING MEMBER GEESMAN: I would
20 encourage you to include that in your list of
21 options.

22 MR. FONG: All right. For the
23 alternative fuel options that we believe merit
24 some consideration in this energy report. I have
25 listed those here. We are hopeful that others

1 might identify some additional options that we
2 would consider.

3 The ones we have previously examined and
4 continue to be very positive about include bio-
5 diesel. This is a fuel produced from vegetable
6 oils or oils previously used in the restaurant
7 energy. It is used primarily in heavy duty
8 vehicles.

9 We are also hopeful that some emerging
10 OEM products in the light duty vehicle sector can
11 use compressed natural gas.

12 There is still some positive
13 applications for electric battery technologies
14 which we want to explore.

15 Ethanol fuel, which is primarily used as
16 a blending ingredient. We also have analysis
17 looking at a higher order blend that would go into
18 fuel flexible vehicles, which are currently being
19 marketed here in California.

20 There are additional hybrid electric
21 vehicles that we call good connected or plug-ins
22 that we see having very positive economics.

23 There is a fuel derived from natural gas
24 which we are now calling gas to liquid fuel that
25 is being developed quite extensively by the all

1 industry. Again, this is a fuel that would go
2 into diesel-powered engines.

3 Hydrogen. I am sure most of you have
4 heard the state is currently working on Governor
5 Schwarzenegger's Initiative called "The Hydrogen
6 Highway Network".

7 We also see continuing deployment and
8 use of LNG and CNG in trucks.

9 Liquified Petroleum Gas or LPG also
10 continues to find nitch market applications.

11 Lastly, a new category that we have not
12 previously analyzed which would include heavy duty
13 Hybrid Hydraulic and Hybrid Electric type
14 technologies in the heavy duty sector.

15 We have a third category of petroleum
16 reduction options, which we label VMT reduction
17 options. We did a screening exercise in 2003
18 looking at these options to try to determine sort
19 of an upper-bound petroleum reduction potential.

20 We were not able to, however, determine
21 what might be the cost and potential
22 implementation of many of these VMT reduction
23 options. At this time, we certainly invite
24 members of the public and other interest parties
25 to bring to our attention any potential missed

1 opportunities in this particular area.

2 We are not planning an extensive redo of
3 that screening analysis that we did in 2003 for
4 these particular options. For the record, some of
5 these options include expanded use of public
6 transit. We have this very broad-based concept of
7 smart energy growth, which is part of land use
8 planning.

9 There is a host of VMT reduction
10 measures that have been tried on the local level.
11 These include telecommuting policies, ridesharing
12 policies, the use of a compressed work week, and
13 the use of transportation allowances in lieu of,
14 for example, free parking.

15 There is also an opportunity to
16 accelerate more efficient vehicles. We can do
17 that by accelerating vehicle retirement.

18 There is a possibility of saving fuel
19 through reducing highway speed limits. Recently,
20 California is now exploring the potential of a
21 high speed rail system. That again would
22 potentially reduce single occupancy vehicle travel
23 through high speed rail.

24 Lastly, because of the magnitude of the
25 movement of goods, many ports are now trying to

1 develop efficient freight movement systems and
2 programs that can relieve the bottlenecks which
3 are occurring at many of our ports in the Bay Area
4 and in the Los Angeles/Long Beach area.

5 For those of you who want to submit
6 written comments, we have a deadline of January 7,
7 2005. The workshop notice provides instructions
8 for submitting those written comments, but please
9 clearly indicate on those comments that they are
10 intended for the 2005 Energy Report Petroleum
11 Analysis. The Docket No. for those comments is
12 04-IEP-01-A.

13 That completes my prepared remarks. We
14 would be glad to answer any questions at this
15 time.

16 PRESIDING MEMBER GEESMAN: Hearing
17 none --

18 CAPT. MULDOON: (Inaudible.)

19 PRESIDING MEMBER GEESMAN: Yes, go
20 ahead.

21 CAPT. MULDOON: Yes, this is Capt. Jim
22 Muldoon with the United States Air Force stationed
23 in Detroit with the United States Army National
24 Automotive Center.

25 Some of the things that may be a

1 possibility, things that we are investing is
2 obviously plain electrical vehicles, anywhere from
3 a half ton pick up, quarter ton pick up, and then
4 of course your NEV's and city vehicles.

5 Along with that, we are also
6 investigating more use of hydrogen and natural gas
7 blends, as well as waste to gas, kind of like the
8 gas to liquids, but also waste products, either
9 animal, human, or municipal waste to include
10 tires.

11 I wonder if any of those were included
12 into (inaudible) to better use resources and
13 infrastructure.

14 MR. FONG: We will be examining some
15 opportunities in electric vehicle drive, but if
16 you have case studies or analysis that supports
17 the work that you are doing, we certainly would
18 value getting copies of that material. Any
19 assumptions that you were asked to make as you
20 develop those programs, we would also be very
21 interested in seeing.

22 We recognize that there are probably a
23 lot of nitch applications where those technologies
24 make a lot of sense. We are very interested in
25 knowing about where those applications are being

1 used in a successful way and what drives the
2 particular application and use. So, if you have
3 that material, again, we welcome their submission
4 and hope to hear from you.

5 CAPT. MULDOON: All right. It sounds
6 like you are getting some of your information from
7 Epri Power Research Institute as well as maybe
8 some influence from West Start/Cal Start. We are
9 working with both of those organizations to
10 maximize our resources.

11 We are also working with the airlines as
12 well, both for on the ramp as well as
13 transportation and vehicle use in and around the
14 whole facilities. I didn't hear anything
15 pertaining that market as well.

16 MR. FONG: Yeah, that wasn't on my
17 prepared slides, but we recognize that ground
18 support opportunities at airports exist for these
19 non-petroleum fields, so we are going to be
20 looking at those options too.

21 CAPT MULDOON: Up here in Ann Arbor, EPA
22 is pushing really rather hard the hybrid hydraulic
23 drive frame, both from a parallel, but they also
24 think that the series configuration can work out
25 along with the CVT type of technology. We

1 received some information, some presentations that
2 do technologies and hydraulic pumps and motors has
3 really increased the efficiency.

4 Before it was a convenience to use it,
5 but now the efficiencies are coming right up with
6 the electric drive.

7 MR. FONG: We certainly agree. The
8 hydraulic drive systems do look extremely
9 positive. They are relatively easy to implement,
10 and they should have a very rapid payback.

11 MR. BOYD: You might point out that we
12 have over a dozen speakers we have arranged to
13 have speak, and the gentleman has brought up
14 several of the subjects I think some of them will
15 broach. Certainly hythane, bio-gas, hybrid
16 hydraulics. Our first speaker when we get to that
17 point will be the CalStart WestStart people, so I
18 think they will add something to the body of
19 knowledge here today.

20 CAPT. MULDOON: Great.

21 PRESIDING MEMBER GEESMAN: Other
22 comments from the phone?

23 (No response.)

24 MR. FONG: Why don't we go to CalStart,
25 John Boesel.

1 MR. BOESEL: Good morning,
2 Commissioners. I very much appreciate this
3 opportunity to talk to you and discuss this very
4 important subject facing the state.

5 Just a quick overview on who we are. We
6 are a not for profit organization that works with
7 industry and public/private partnerships to create
8 high quality jobs, clean the air, reduce our
9 dependence on foreign oil, and increase energy
10 efficiency.

11 We are a membership organization. We
12 have over 115 participating organizations,
13 including the California Energy Commission through
14 Commissioner Boyd's participation on our Board of
15 Directors.

16 A very diverse group of companies that
17 represent our fuel neutrality. There are
18 companies working on hybrid technology, natural
19 gas, hydrogen, fuel cells, a wide array of
20 technologies.

21 I thought in terms of updating this
22 report, we would first sort of focus on what
23 hasn't changed since the report came out over a
24 year ago and was presented to the administration.

25 The situation in terms of who has the

1 oil has not changed very much. Clearly, OPEC has
2 it, and our reserves here in the U.S. are very
3 small comparatively speaking. According to the
4 Department of Energy, the five countries within
5 OPEC that have the oil are based in the Middle
6 East, and they have about two-thirds of the proven
7 reserves as we know them today. There is the
8 United States consuming about a quarter of the
9 world's oil on a daily basis.

10 I think it is fair to say that the
11 nations that have significant future reserves of
12 oil or either unstable, undemocratic, hostile to
13 the United States, or some combination of the
14 above.

15 California resident George Schultz
16 recently in a forward to a new book that came out
17 in October, said, how many more times must we be
18 hit on the head by a 2 x 4 before we do something
19 decisive about this acute problem.

20 What has the federal government in the
21 last 31 years since President Nixon announced
22 Project Independence. Basically, our dependence
23 on foreign oil has grown over 50 percent during
24 that period as we are now approximately 60 to 65
25 dependent on foreign oil. We started out at 40

1 percent in 1973. Of course, our dependence on
2 OPEC is increasing.

3 Will this be another legacy of the baby
4 boomer generation is a fair question to ask.
5 According to the Energy Information
6 Administration, oil prices are expected to
7 increase, and I think we will continue to see the
8 price volatility that we have seen over the past
9 20 and 30 years.

10 According again to the Energy
11 Information Agency, there is burning oil remains
12 the largest source of CO2 and greenhouse gas
13 emissions and they predict that will continue to
14 be the case in 2025.

15 Just a few points on the climate change
16 situation. Just some pictures that came out most
17 recently comparing what is happening in Alaska
18 over the last 100 years, as you can see in one
19 picture showing where these glaciers existed about
20 100 years ago and where they are today. There is
21 actually vegetation growing in those places.

22 Here is another picture showing a
23 glacier emptying into a glacial lake, and that is
24 now a dust covered glacier that is stagnant and
25 not moving. So, I think some very graphic

1 examples of what is happening in Alaska. Even
2 Senator Stevens is saying things have warmed up
3 here. We are not challenging that anymore.

4 There is some question in his mind about
5 why they are warming up, but there is no question
6 that things are warming up.

7 Since the last year, when this report
8 came out, there was a very well done study by a
9 number of scientists and the proceedings were
10 published in the National Academy of Sciences
11 talking about the threats specifically to the
12 state from climate change in terms of our Sierra
13 snowpack.

14 What was most disturbing in my mind was
15 this 2070 to 2099 time frame. Under a low
16 emissions scenario, we have 27 percent of the
17 Sierra snowpack remaining. So, there is a window
18 of opportunity here that is open, and we need to
19 react quickly and move quickly if we are going to
20 address it.

21 What has changed during this time period
22 is that the hybrid market is booming. Current
23 demand is outstripping supply. According to the
24 Wall Street Journal, when you factor in the fuel
25 savings tax rebates, you actually have a net

1 economic gain with today's oil prices.

2 There are four models of hybrids now
3 available, eight models by the end of 2005, and
4 probably 50 by the end of 2010 based on a number
5 of announcements. A leading executive with Toyota
6 said the future will be a hybrid society.

7 There was mention to various heavy duty
8 hybrid technology, and I think this whole area has
9 grown dramatically in the last year. At our
10 national meeting we put on called the HTUF, The
11 Hybrid Truck Users Forum, we had over 250 fleet
12 and industry attendees come, a 45 percent increase
13 over the previous year. There was almost a
14 doubling of the vehicles available for ride and
15 drive and demonstration.

16 This International Truck and Engine said
17 that they will go into production of this truck.
18 They will provide 20 of them under a program with
19 the Department of Defense. It is a hybrid
20 electric truck. They estimate about 50 percent
21 improvement in fuel economy.

22 What was very encouraging was that
23 International said that they will go into limited
24 commercial production in 2006.

25 Then there was mention of hydraulic

1 hybrids that have come to the for. A possible
2 lower cost hybrid system, and there are a number
3 of major players pursuing this technology
4 including Eaton, Parker Hannafin, and Dana, as
5 well as the US EPA in Ann Arbor actually has some
6 intellectual property in this area.

7 With some funding from the South Coast
8 Qir Quality Management District, we are taking a
9 hydraulic system developed by Eaton, and we will
10 be demonstrating it at a natural gas refuse truck.

11 I think when we start thinking about
12 some of the combinations of alternative fuels and
13 some of these hybrid technologies, we get some
14 very impressive environmental and energy benefits
15 from that.

16 Mercedes has announced that they will
17 have a 50 state diesel engine by 2007. So, if
18 they are able to do that, then we will have
19 another option for improving fuel economy.

20 Dan mentioned idle management
21 technology. I think it is really becoming
22 mainstream beyond truck stop electrification,
23 Caterpillar, Freightliner, and Cummins have all
24 announced idle management technologies and said
25 they will begin offering next year. Basically,

1 most of them come down to a smaller diesel engine
2 on board that is somewhere between three to ten
3 horse power engine that is much more efficient,
4 quieter, and doesn't require the main engine to be
5 running. I think that is another area where we
6 will see significant fuel improvements.

7 Another area that Dan mentioned that the
8 VMT section was not going to be updated, but bus
9 rapid transit is really taking off nationwide, but
10 particularly here in California.

11 In the Los Angeles County, MTA has
12 actually had success in getting people out of
13 their cars and getting into busses using bus rapid
14 transit service where you are providing rail-like
15 service but using busses, and it is getting people
16 there faster and making them enjoy the experience
17 more.

18 You see down below there, their latest
19 60 foot articulated natural gas bus that will go
20 into service in the San Fernando Valley. What is
21 exciting is not only is this a new way to get
22 people out of their cars, but this segment will be
23 significantly advanced in terms of 50 percent of
24 the new vehicles will be powered by alternative
25 fuels or hybrid systems.

1 Another project that we are working on
2 that I think there is some opportunity to look at
3 it are E-scooters for commuters. As an example of
4 ways to get people to and from rail stations
5 easily and quickly, this is a program we have in
6 down in Pasadena where they put in the new Gold
7 Line, but they have several stations where there
8 is no parking.

9 These smaller electric vehicles can be a
10 great way to get people to and from transit
11 stations and certainly doing it at a price well
12 below the cost of trying to build new parking
13 lots.

14 When we were launched in 1992 was really
15 with the goal of trying to address all these
16 problems by creating high quality jobs and this
17 year we did an updated report on California's
18 clean vehicle industry. It was interesting to
19 find that we identified 125 companies and
20 organizations within California that were working
21 on transportation technologies related to
22 greenhouse gas amazon controls.

23 We survey them, and we found that 74
24 percent of the respondents found that strong
25 greenhouse gas emission control regulations would

1 positively or very positively effect their
2 business operations in California and encourage
3 them to invest more in hire more people in the
4 State of California.

5 Just a few examples of strong state
6 leadership and public/private partnerships that I
7 thought would be worth sharing here today is that
8 along similar to the AB2076 report, the European
9 Commission has adopted a program to use 23 percent
10 of alternative fuels by 2020.

11 They are in the process of updating this
12 report. As you can see, they are recommending a
13 pursuit of a portfolio approach and not rely on a
14 single fuel, and it is our understanding that when
15 they update this report, they may actually
16 increase the total to somewhere closer to 30
17 percent and that they feel very confident about
18 the natural gas number and the bio-fuel number.

19 They hydrogen number they think may be a
20 little too optimistic and they probably are going
21 to revise that downward to perhaps 2 percent.

22 Just as an example of what Germany is
23 doing to really promote natural gas, they are
24 planning to go from 20,000 to more than half a
25 million natural gas vehicles from now to 2018.

1 They have put in 1,000 stations, and even though
2 they don't have a lot of natural gas reserves,
3 this pie chart shows that there are a number of
4 countries where they think they can get the
5 natural gas from, and they feel better about the
6 geo-political risk associated from getting their
7 energy from these countries rather than the Middle
8 East.

9 One of the fuels that wasn't mentioned
10 in the report was biomethane or renewable methane
11 that I think is worth considering. It is
12 certainly working in Sweden where half of the
13 methane for their natural gas vehicle fleet in
14 Western Sweden comes from biological sources and
15 is truly renewable.

16 What Republican Governor Pawlenty in
17 Minnesota is pursuing a very aggressive program to
18 cut the State's energy consumption by 50 percent
19 and primarily relying on a bio-fuel strategy going
20 from perhaps 10 to 20 percent ethanol and then
21 having a B-2 standard for all vehicles starting
22 July 1, 2005, so 2 percent bio-diesel.

23 In general, we had an electricity
24 crisis, and there were certain measures that
25 perhaps could have been taken in the late 1990's

1 to avoid that crisis. The Californians will now
2 be paying for that inaction in that crisis until
3 2020, so let's hope that we can move proactively
4 now to avoid a similar crisis on the
5 transportation side of things.

6 California has been clearly been a
7 leader in this area in terms of air quality global
8 warming. Can we at the state level become a true
9 leader in terms of energies security. Why is the
10 time right for a California First strategy. We
11 have higher than average gasoline and diesel
12 prices.

13 We are the most vulnerable, the world's
14 second largest consumer of oil and transportation
15 sector behind the US as a whole. We are very
16 familiar with the electricity crisis, and we have
17 these tremendous recommendations that came out of
18 the AB2076 report. All that good work, and I
19 think it is really now time to put that into
20 action.

21 Just a menu of possible options that we
22 would like to see the CEC recommend that the
23 legislature take and start advocating before the
24 legislature is that the state could really become
25 a model fleet operator, not five years, ten years

1 from now, but tomorrow, and be saying that we are
2 only going to be purchasing hybrids or alternative
3 fuel vehicles.

4 We could have fleet rules similar to
5 what the South Coast Air Quality Management has
6 done, not for air pollution but for energy
7 security reasons on a statewide basis.

8 We could have a Moyer-type program for
9 energy security or at the very least phase in the
10 energy security criteria to the existing Moyer
11 program.

12 Certainly parking in Europe is proving
13 to be a major incentive for the use of advanced
14 vehicles. In all the state's garages there could
15 be incentives for alternative fuels and hybrid
16 vehicles, and this could also be required at the
17 local level by local agencies for new parking lots
18 being built.

19 There is a possibility of revenue and
20 weight-neutral fee bates, so we are not getting
21 into an issue about big cars versus cars, but that
22 a fee could be placed on inefficient SUV's and
23 that could be used to pay for discounts on more
24 efficient SUV's.

25 There is also a lot of interest in pay

1 as you drive car insurance. That still would take
2 into effect driving records and age and all those
3 key factors, but it would also take in more into
4 effect how much you drive.

5 There is as they are doing in Minnesota,
6 the possibility of renewable fuel standard. We
7 have 5.6 percent of our fuel today is renewable.
8 It could be 10 to 20 percent over the next five
9 years. We could look at more bio-diesel, and I
10 believe that there are strategies that exist to
11 offset the possible increase in NOX emissions from
12 those fuel additives.

13 There could also be a measure as part of
14 the renewable fuel standard to say that a fuel
15 provider could comply with these measures by
16 selling or buying credits from alternative fuel
17 providers such as natural gas or propane.

18 Lastly, I think lastly, a penny a gallon
19 fee to incentivize the use of alternative fuels
20 and support advance vehicle technology research
21 and development I think would be highly welcomed
22 and desired by many.

23 Lastly, I know that there were a number
24 of questions in the report, the publication that
25 was put out in advance of this hearing, is

1 hydrogen the answer. The Department of Energy is
2 saying that they can't determine whether or not
3 hydrogen has a business case until 2015 because
4 there are too many financial and technical
5 unknowns. Then they can't even say if it is going
6 to be a positive decision at that time.

7 Many of the oil and car companies are
8 largely in agreement with this time frame, so if
9 we think this is a really urgent problem, it seems
10 that relying simply on hydrogen would be a risky
11 strategy, and we say it is a tool in the tool kit.
12 It is not in itself the tool kit.

13 I think this is a slide that from a car
14 manufacturer that lays out a few approaches. We
15 will start out with improvements in internal
16 combustion engine technologies, we will move to
17 hybrids, and then the hydrogen fuel cell over the
18 long term.

19 I think as we transition from a mono to
20 a polyfuel future, we can have a richer scenario
21 here where natural gas vehicles play a role,
22 battery electric vehicles, I think the best days
23 are still ahead of us.

24 Hydrogen, internal combustion engine
25 vehicles have potential. Certainly lightweight

1 materials I think we have just begun to see what
2 they can do. Biofuels, and then as I said
3 earlier, when you start combining hybrid
4 technology with any alternative fuel, you get some
5 really fuel cell like benefits.

6 Of course, I think we need smart growth
7 and pro-transit policies need to be part of this
8 plan.

9 Let me just say that the CEC, with the
10 AB2076 report and as they were integrated into the
11 IEPR, the goals are great. It is really time for
12 action now. When there is a fire, who do you
13 call? The fire department. When there is a
14 pending transportation or energy crisis, who do
15 you call? If we don't put forth a plan now, when
16 are going to do it, and I look forward to this new
17 analysis being done, but I also hope we can put
18 forward an aggressive plan so that in a not too
19 distant future, we can start working towards those
20 goals.

21 In summary, the transportation energy
22 challenges are real, though they may not appear
23 immediate to some. If we do nothing, we really
24 put our economy at risk and our environment
25 remains seriously threatened.

1 The good news is that working together,
2 we can create a pro-job and pro-environment
3 solution that is really very good for the long
4 term future of the state. Thank you very much.

5 PRESIDING MEMBER GEESMAN: Thank you,
6 John.

7 COMMISSIONER BOYD: John, a question.
8 You mentioned a Moyer program for energy security.
9 Could I get you to elaborate on that just a little
10 bit more.

11 MR. BOESEL: I think the Moyer program
12 has proven to be quite effective in terms of
13 reducing NOX emissions. It will now have some
14 additional criteria to take into consideration our
15 particulate matter. So, I think we are seeing
16 some impressive gains in terms of taking out some
17 older diesel engines and putting in some newer
18 diesel engines.

19 That doesn't help with our energy
20 security issues. So, if there was a similar
21 program where revenue was generated somehow
22 throughout the penny of a gallon gas tax, maybe
23 also through vehicle registration fees, so I said
24 that yes, we want the NOX and PM reduction
25 benefits, but we really want to reduce our

1 dependence on foreign. That could really help
2 stimulate more activity in this area.

3 I think the good news, too, is that we
4 are constrained by our refinery capacity. If we
5 were able to start transitioning slowly to
6 alternative fuels now, we could actually help
7 address that refinery capacity issue by reducing
8 demand. Then there would be more slack in the
9 system, and we wouldn't have these price spikes
10 when there is an explosion or something happens at
11 a refinery.

12 COMMISSIONER BOYD: Thank you.

13 PRESIDING MEMBER: You mentioned that
14 you thought that there were some corrective
15 actions that could be taken to reduce potential
16 increases in NOX from some of the alternative
17 fuels. What are your thoughts there?

18 MR. BOESEL: I think there are a number
19 of solutions being pursued for bio-diesel, for
20 example. I think when we also look at the 2010
21 on-road diesel standards, whatever is out there is
22 going to have to be very clean. If a B-10 or a B-
23 20 addition to a new diesel engine system slightly
24 increases it, I think it will be offset by all the
25 other emission control devices that are part of

1 that system to reduce emissions in total.

2 I think there are also a number of
3 additives that are being pursued that can help
4 address that.

5 On the ethanol issue, there are others
6 who are more expert than I on this, but I think by
7 actually increasing the percentage of ethanol,
8 that will actually help address the evaporative
9 emissions issue.

10 PRESIDING MEMBER GEESMAN: Thanks very
11 much.

12 COMMISSIONER BOYD: Thank you, John, I
13 appreciate it. I always appreciate what knowledge
14 CalStart has of what is going on out there and
15 sharing that with the rest of us. Thanks.

16 PRESIDING MEMBER GEESMAN: Cynthia
17 Verdugo-Peralta.

18 MS. VERDUGO-PERALTA: Good morning, I am
19 Cynthia Verdugo-Peralta. I am the governor's
20 appointee to the South Coast Air Quality
21 Management District Governing Board. I represent
22 my AQMD on the steering team of the California
23 Fuel Cell Partnership. I also represent all 35 of
24 the APCD's on the governor's Hydrogen Highway Net
25 Advisory Panel as well.

1 In addition, I am also an energy
2 efficiency specialist certified by this very
3 agency over 20 years ago.

4 On behalf of the South Coast AQMD, I
5 would like to thank Commissioners Boyd and Geesman
6 for holding this workshop on a vitally important
7 set of questions regarding our transportation
8 sector and the need for energy efficiency and
9 alternative fuels.

10 I should say at the outset that I
11 consider the management of our carbon-use cycle as
12 a single greatest challenge facing our state as
13 well as our nation.

14 Air quality and energy will remain
15 inherently linked as our two agencies continue to
16 address public health, energy resource depletion,
17 and climate change issues in a coherent and
18 coordinated fashion.

19 I would like to first provide you with a
20 brief overview of our current air quality
21 experience which we believe should be a critical
22 consideration as these issues are framed.

23 I am pleased to say that the ozone
24 season for 2004 was undoubtedly cleaner than the
25 preceding year, and in fact, our cleanest on

1 record.

2 This past year, we experienced our
3 fewest number of days ever recorded for exceeding
4 both the one hour and the eight hour o-zone
5 standard.

6 While our air basin had the highest
7 eight hour average o-zone in the nation, the
8 highest number of days above the eight hour
9 standard national air occurred in the San Joaquin
10 Valley. However, it should also be noted that
11 cooler weather prevailed during much of the
12 summer.

13 When we look at the three-year running
14 average of air quality levels, it becomes clear
15 that progress since the late 1990's had slowed
16 dramatically and is now essentially static.

17 This is true for both our one hour and
18 eight hour ozone levels. Relative to federal air
19 standards, we still face serious challenges in
20 meeting ozone standards, especially for attaining
21 the eight hour standard. We have even more
22 difficulty attaining the PM 2.5 standard, which we
23 exceed by over 180 percent.

24 Diesel emissions remain our largest
25 source of air borne toxic risk representing over

1 70 percent of such risk. Gasoline related
2 emissions of benzene and other aromatic hydro-
3 carbons account for an additional 18 percent,
4 which means that mobile source emissions in our
5 basin account for 89 percent of air toxic risk in
6 Southern California.

7 Mobile sources represent the most
8 significant portion, 51 percent of all the OC
9 emissions and 75 percent of all NOX emissions.
10 Simply stated, we fail to dramatically reduce
11 mobile sources. If we do so, the South Coast Air
12 Basin will be unable to attain the federally
13 prescribed public health standards for air
14 quality. For us, this also means that we would be
15 losing funding for the programs that we support
16 for alternative fuels.

17 I would like to now discuss our
18 perspective on near, medium, and longer term
19 energy issues which intersect our air quality
20 problems in the South Coast Basin.

21 First and foremost, fuel and energy or I
22 should say engine technology issues must be seen
23 as a synergistic system. Vehicle emissions create
24 both potentially irreversible health consequences
25 as well as greenhouse gas emissions which can

1 possibly cause irreversible global climactic
2 effects.

3 The lack of readily available
4 substitutes for oil also creates major economic
5 vulnerabilities to oil resource depletion. Until
6 recently, the price of conventional petroleum-
7 based fuels was not high enough to trigger
8 substantial market opportunities for alternative
9 fuels.

10 Now, however, we see that the
11 assumptions made about energy prices need to be
12 dramatically revised. Such upward price revision
13 will inevitably reinforce the economic benefits of
14 vehicle hybridization as well as alternative fuel
15 vehicles.

16 Regarding alternative fuels in the near
17 term, natural gas technologies remain the
18 benchmark for the lowest heavy duty NOX emission
19 levels. CNG light duty vehicles such as the Honda
20 Civic combined with its home refueling appliance
21 which Honda affectionately calls "Phil", offers a
22 realistic option as well.

23 LNG trucks and busses offer additional
24 opportunities to diversify our energy mix while
25 providing significant air quality advantages, both

1 in terms of NOX and toxic emissions.

2 As we approach the possible peak
3 production of oil globally during the decade or
4 next natural gas vehicle options will prove
5 increasingly valuable.

6 Another important option for extending
7 our diesel supplies both as a blend stock and as a
8 neat fuel is gas to liquid technology which offers
9 zero sulphur and aromatic levels which are
10 extremely attractive from an air quality
11 standpoint.

12 The high number of such Fischer-Tropsch
13 diesel, for example, makes it a very desirable
14 fuel component, but also provides an opportunity
15 for low NOX emissions by increasing the potential
16 for the use of advance diesel exhaust gas
17 recirculation or EGR technology.

18 I also want to make one other point on
19 the issue of peak oil production. While it is
20 impossible to predict with any great certainty
21 when production levels will begin to ultimately
22 slowly decline, once they do, that very fact alone
23 may also cause an unprecedented change in the
24 volatility of global oil markets to the great
25 detriment of California, which is especially

1 vulnerable to oil price spikes.

2 In order to meet federal and state air
3 quality standards, there is going to be increasing
4 regulation in the mobile sector that is going to
5 drive industry to cleaner technologies including
6 electro-drive technology.

7 We see a significant role for electro-
8 drive technologies. This includes dramatic
9 expansion of full hybrids across the entire
10 vehicle product line for light, medium, and heavy
11 duty vehicles.

12 Plug-in hybridization is an extremely
13 important technology and should be further
14 encouraged by state policy. We also see it as a
15 significant bridging technology to the California
16 Hydrogen Highway Net. As you may know, we are
17 currently working with Daimler Chrysler, EPRI, and
18 SCE on a demonstration electro-drive technology.

19 Heavy duty hybridization offers perhaps
20 the greatest potential for energy efficiency
21 increases in that market segment. Gasoline hybrid
22 busses are far cleaner than their diesel hybrid
23 counterparts.

24 There has also been much recent
25 discussion about the possible role of additional

1 ethanol use in the state. Paul Wuebben, who is
2 here today from my staff is here with me and can
3 provide an additional technological perspective on
4 the issues of concern to this agency.

5 In general, I should note that we at the
6 South Coast AWMD are very concerned about the
7 additional 19 to 25 tons per day of VOC emissions
8 in our basin, which the ARB as recently associated
9 with the permeation related emissions from
10 gasoline containing ethanol blends.

11 Of course, it is crucial that we take a
12 long term perspective on finding zero carbon
13 transportation options which will offer a truly
14 sustainable source of mobility. The most
15 important option will offer a truly sustainable
16 source and the most important option is also in
17 regard is the hydrogen fuel cell vehicle.

18 We are very pleased that the state is
19 working to establish a growing network of
20 refueling stations to accelerate this emerging
21 technology.

22 While we recognize that there are
23 technological barriers which still must be
24 overcome with respect to vehicle cost,
25 infrastructure, availability, and fuel storage

1 medium, we believe that it is incumbent on the
2 state to make the investments needed to insure
3 that the full potential of the hydrogen economy is
4 realized as soon as possible.

5 Looking at technology commercialization,
6 the South Coast AQMD has established a number of
7 fleet rules which we believe offer a template for
8 similar programs throughout the state.

9 We have adopted seven specific fleet
10 rules which cover public and private fleets. As
11 you know, we have formally petitioned the ARB to
12 submit our fleet rules to the EPA for a waiver
13 from a prohibition on the federal Clean Air Act.

14 This action would help sustain the very
15 positive market momentum which existed prior to
16 the Supreme Court action which remanded the case
17 back to federal district court to determine
18 whether the South Coast AQMD is preempted from
19 implementing the rules as they apply to public
20 fleets.

21 Significant incentive funding has been
22 an essential stimulus to the near term
23 commercialization of alternative fuel
24 technologies.

25 The Carl Moyer program has provided \$110

1 million state-wide and we believe the recent
2 infusion of additional state funds into this
3 program will provide significant benefit.

4 Our agency has, as a policy matter,
5 targeted our Moyer funding to alternative fuel
6 projects as we consider the need for non-petroleum
7 options to be of such high value both in terms of
8 our air quality and energy diversification.

9 Through the South Coast AQMD's
10 technology advancement office in cooperation with
11 our strategic partners, the DOE, CEC, ARB and
12 other organizations, we are working on a wide
13 range of important technologies. These include
14 diesel after treatment, emulsified diesel, heavy
15 duty natural gas engines and infrastructure,
16 enhance CNG and LNG gas specifications, advance
17 high efficiency, diesel engines, advance hybrid
18 vehicles including plug-in and hydraulic
19 technologies, gas to liquid which is GTL, fuels
20 formulations, renewable energy projects, hydrogen
21 internal combustion engine demonstrations,
22 hydrogen infrastructure, and fuel cell vehicle
23 demonstrations.

24 Each of these technologies offers an
25 important step along the path towards low and zero

1 carbon emission alternatives.

2 As we look forward, it is crucial that
3 the CEC place its highest near term priority on
4 encouraging the adoption of the AB 2076 report,
5 which we view as an excellent blue print for
6 addressing this inter-related issues.

7 The energy efficiency targets laid out
8 in the report are extremely important as we move
9 forward. In many ways, the failure of congress to
10 adequately address our need for updating CAFE
11 standards is without question the central failure
12 on energy policy at the national level.

13 While California does not directly have
14 authority on this area, there are many important
15 initiatives which we should bring forward to give
16 this matter such greater currency.

17 We also want to encourage energy
18 efficiency and load management protocol and
19 programs as well as shifting the load to off-peak.

20 We all learned a very hard lesson during
21 the last energy crisis. Those of us in the
22 industry know full well that the next one can be
23 right around the corner without good planning. In
24 addition, too many do not know of the adverse air
25 quality effects which were directly related to the

1 executive orders to allow the generating stations
2 to emit beyond their permitted levels to keep the
3 lights on.

4 Load management and energy efficiency
5 program planning needs to be inclusive of the
6 utilities. More importantly, you need to make
7 sure your sister agency, the CPUC, recognizes the
8 importance of these programs as well as
9 alternative fuel programs, which they have tried
10 to disallow in the annual budgets of the
11 utilities.

12 We desperately need the research and
13 development which these programs provide in our
14 quest for clean air as well as energy reliability.
15 There are also a number of areas which we believe
16 the additional CEC effort would be particularly
17 constructive.

18 Updating of AB 2076 economic break even
19 analysis of hybrid vehicles to reflect more recent
20 oil price realities, the development of a state
21 vehicle purchasing handbook which highlights the
22 most energy efficient and alternative fuel
23 technologies available, the request from the CEC
24 to OTTO and engine manufacturers for status
25 reports on their efforts to bring more high

1 efficiency and alternative fuel vehicles to market
2 in the near and medium term.

3 Enhanced life cycle analytical methods
4 could also give the state better tools with which
5 to determine development of a draft petroleum
6 fuels and carbon emission diet for the state's
7 vehicle fleet, and development of contingency
8 planning scenarios which consider the consequences
9 from a severe shortage of petroleum-based fuels
10 resulting from one or more unexpected worst-case
11 catastrophic events.

12 Such scenario development could provide
13 valuable insights and perspective by decision
14 leaders on the degree of vulnerability of the
15 state to such occurrences.

16 I, along with my fellow governing board
17 members, commend the CEC for holding this workshop
18 and look forward to further cooperative efforts of
19 our agencies.

20 Thank you very much for allowing me to
21 speak today.

22 PRESIDING MEMBER GEESMAN: Cynthia,
23 thank you for your very compelling statement. Our
24 agencies have enjoyed a good working relationship
25 in the past and hopefully in this 2005 cycle, we

1 can do more to make certain that the concerns of
2 the South Coast Air Quality Management District
3 are at the center of the transportation fuel
4 strategy that we articulate.

5 MS. VERDUGO-PERALTA: We would
6 appreciate that.

7 COMMISSIONER PFANNENSTIEL: I just have
8 a quick question. You discussed quite
9 comprehensively what you are looking at for
10 alternate fuels and efficiency programs. I
11 thought that was very very compelling. Are you
12 doing much to look at the reduction in vehicle
13 miles traveled.

14 MS. VERDUGO-PERALTA: We do have the
15 trip program, miles per trip. We did have also
16 the ride share on Thursday, there has been a
17 program that they have allowed the companies to
18 expand the options of how to reduce the miles.
19 So, it is an expanded program of what the original
20 one was, which was a little bit restrictive for
21 the companies that were involved.

22 COMMISSIONER PFANNENSTIEL: Thank you.

23 PRESIDING MEMBER GEESMAN: Thank you,
24 Cynthia, good to see you again.

25 MS. VERDUGO-PERALTA: Good to see you

1 too.

2 PRESIDING MEMBER GEESMAN: Now, she
3 invited Paul to address the ethanol question.
4 Paul, I wonder if you would do that for us now.

5 MR. WUEBBEN: Thank you, Mr. Geesman and
6 Mr. Boyd. Obviously, it is a pleasure to be here.
7 I just want to add one quick statement to follow
8 the statement of Ms. Verdugo-Peralta, namely on
9 the ethanol question. As you heard, the Air
10 Resources Board has recently found there to be
11 significant permeation emissions that are inherent
12 in the use of ethanol in our current gasoline
13 stock. Those are unexpected.

14 The estimates could range from 19 to 25
15 tons per day in our air basin. That is a
16 significant increase in the existing black box if
17 you will to the emission inventory which we had
18 not anticipated. In fact, that increment is not
19 included in the formal inventory that was adopted
20 by our district and then incorporated in the state
21 implementation plans.

22 That does present us with some real
23 challenges. We've definitely commend ARB for
24 trying to seek some possible redefinitions of this
25 state's gasoline standards. We know that is a

1 very difficult process given that you've got to
2 balance the current re-vapor pressure and other
3 parts of that standard with this increase. We
4 think there should be some very significant effort
5 made to try to at least for the summer months, at
6 a minimum, to try to ameliorate that and perhaps
7 move to a balanced renewable standard that allowed
8 the summertime oxygen leverage to be as low as
9 zero.

10 If you step back from an analytical
11 standpoint, given the current technology that we
12 see in place, that is will be in play through the
13 next 20 years, the current vehicles in the fleet
14 essentially are impervious to the effect of oxygen
15 with the latest three-way catalyst technology and
16 computer technology. That oxygen is really
17 serving octane functions, it is serving volume
18 expansion functions, but it is not necessarily
19 serving emission reduction function.

20 When we step back, it would appear that
21 the cleanest gasoline if you were looking from an
22 idealistic standpoint would be zero oxygen in our
23 gasoline pool.

24 Now we realize that at the federal
25 level, and Mr. Boyd is fully aware of as you are

1 I'm sure, the full Commission is, there is a
2 waiver question. We as an agency have supported
3 and continue to support the ARB's seeking that
4 waiver through EPA through the course we have
5 formed as a formal, joined as a formal intervenor
6 in that case, as you know. So, there is some
7 complexities in this question about the waiver of
8 the oxygen requirements that impeded perhaps a
9 near-term resolution of this permeation excess
10 emission level.

11 From a longer term standpoint, I think
12 that it would be very realistic for the Energy
13 Commission to try to think about methods to
14 perhaps load the predominant alcohol use during
15 the winter when that additional volatility has
16 much less impact compared to the seven summer
17 months.

18 The other thing that I would just add in
19 conclusion, is that there has recently been a
20 major children's health study which not only
21 reiterated our path findings about ozone health
22 effects, but is added to our knowledge and
23 understanding about low levels of ozone impact.

24 What they have essentially found in
25 comparing twelve communities in California,

1 predominantly in Southern California, was that for
2 children that live in predominantly cleaner areas,
3 that their lungs remain clean, but for the
4 children that live in the higher ozone levels with
5 fairly minimal increases in background ozone
6 levels, that those lung detriment effects are long
7 lasting and in some cases are irreversible.

8 Now that is a health effect we consider
9 to be very fundamental and as you know, ozone
10 compliance has been at the heart of our mission
11 with EM 10 and 2.5 standards are increasingly even
12 more difficult. At a time when there are
13 significant increases in these ozone exposures in
14 the San Joaquin Valley and that we see in effect,
15 a leveling out of our air quality progress. That
16 any increase in a volatile organic compounds,
17 hydro-carbons, would just simply be the wrong
18 approach.

19 We realize that this is a technically
20 complicated question, and we certainly appreciate
21 this forum and others that both CEC and ARB has to
22 examine this. Perhaps now as we start with a
23 fresh look, that there will be a way to address
24 this. I think the permeation data is a very
25 important new set of findings that did not exist

1 during the 2003 2076 process, nor your IEPR.

2 With that, I thank you very much.

3 PRESIDING MEMBER GEESMAN: Can I ask
4 you, Paul, those ARB numbers reflect actual
5 measured experience in the summer of 2004?

6 MR. WUEBBEN: It is an inventory model
7 number. Of course, the 2004 air quality season of
8 which we just had was substantially cleaner than
9 2003. That was predominantly result of the
10 meteorology. It was a much cooler summer. That
11 is why when we step back and look at the three
12 year running average, we actually find that we
13 have had declines through 1998, 1999, and the
14 three year average for both one hour and eight
15 hour.

16 Since about '99/2000, that three year
17 running average has essentially been flat. So, we
18 think that is one means of taking out the
19 uncertainty of meteorology, the variability from
20 meteorology. 2003 was our worst air quality
21 season in six years. That was last year we had
22 the first ozone alert, Stage 1 alert that we have
23 had since 1999. So, there has been some
24 variability, so we certainly wouldn't say that we
25 are close to turning this picture in light of the

1 new children's health data that we have to be
2 particularly careful I think in looking at any
3 increase.

4 PRESIDING MEMBER GEESMAN: Do you have
5 data on the volume of ethanol used per year in
6 your district?

7 MR. WUEBBEN: We have it state-wide.
8 Obviously of the thirteen refineries, the majority
9 are in the South Coast, and the volumes are being
10 expressed there, although, as you know, ethanol is
11 essentially blended at the 70 terminals, not at
12 the refineries because of the limitations on
13 transportation and pipeline. We do understand
14 that the state as a whole has grown from about 100
15 million gallons to about 950 million gallons.
16 Then we would take the lions share about 45
17 percent of that on balance, or maybe probably more
18 handling of bulk ethanol fuel through the South
19 Coast Air Basin because of the infrastructure
20 there. We will want to look at that more
21 carefully I am sure.

22 PRESIDING MEMBER GEESMAN: Thank you
23 very much.

24 COMMISSIONER BOYD: Paul, a question.
25 This permeation issue has been debated for quite

1 some time as you indicated, and this is kind of
2 new information. Not seeing an ARB witness on our
3 list, I'll take advantage of your presence. There
4 are a couple of more questions.

5 Has there been any determination as to
6 where in the system the permeation -- well, I
7 won't say it takes place exclusively, but you
8 know, it probably occurs throughout the system,
9 but is there any identification of major culprits
10 in terms of where emissions might be occurring?

11 MR. WUEBBEN: It does simply seem to be
12 related to the volume that exists at the vehicle,
13 of course, is where most of the fuel use is
14 occurring. How it is distributed between the bulk
15 terminal facilities and the vehicles, I think, is
16 probably a little uncertain because once you get
17 it blended into the gasoline, there is going to be
18 some permeation.

19 The permeation rates that we have seen
20 at ARB workshops indicate that on average, the
21 added increase is equivalent to 1.4 grams per
22 vehicle per day. So, they have sufficient data at
23 least to arrive at that vehicle allocation.

24 I know that Steve Grisby is here.
25 Perhaps he can speak with a lot more knowledge as

1 well on this. Not to put him on the spot, but
2 they have a lot of knowledge, obviously, on this
3 question.

4 COMMISSIONER BOYD: Thank you.

5 MR. FONG: Before we move on, I would
6 like to repeat a request. To those of you who are
7 listening to this workshop on a conference call
8 phone, if your phone has a mute option, please use
9 that option because we tend to pick up all forms
10 of background noise or communication that is
11 occurring in that background and is broadcast here
12 at our workshop. It can be very distracting, and
13 we would hope that those of you who are listening
14 on a conference call phone try to reduce that
15 background noise any way possible. Thank you.

16 We would like to pick up now to have
17 Gerry Bemis of our staff make some introductory
18 remarks about the efficiency program effort here
19 at the Commission and some of the things that we
20 will be seeking from interested parties as we move
21 forward.

22 MR. BEMIS: Thank you. The title of my
23 slide here is Building a Multi-State Coalition to
24 Improve Federal CAFE Standards. That means
25 working with other states to try to influence the

1 federal government to improving CAFE standards.

2 The authority lies with Congress, and we wish to
3 try to influence that effort.

4 As a background piece, as you may all
5 know, gasoline consumption is the largest
6 component of our fuel supply far ahead of any
7 other and increasing rapidly. I agree with the
8 comments made earlier that to the degree that we
9 can get people out of their cars and using transit
10 and other forms of other motor transportation to
11 reduce their personal private vehicle miles
12 traveled, to the degree that they are going to be
13 using personal cars, let's do it in the most
14 efficient vehicles as possible.

15 In the AB 2076 work, the use of more
16 efficient private automobiles was a single largest
17 factor contributing to our projected reduction in
18 gasoline consumption and also the most cost
19 effective.

20 Let's get started. The 2003 IEPR Report
21 had a policy to double the fuel economy of new
22 vehicles by the year 2020.

23 The recent technology advancements now
24 allow for improvement in these vehicles without
25 degrading performance or other vehicle attributes.

1 I am in the process of starting to
2 identify those states that are willing to join a
3 coalition to try to influence the federal decision
4 making process.

5 Here is a slide that compares the
6 vehicle attributes of a 2005 Ford Escape SUV. The
7 column on the far right labeled V-6 four-wheel is
8 a conventional gasoline powered Ford Escape SUV at
9 about \$26,500 as a manufacturers suggested retail
10 price.

11 It has an acceleration of about 11.8
12 0-60 and it also gets about 18 miles per gallon.
13 It has a maximum towing capacity, you can see
14 below, of about 3,500 pounds.

15 This column here labeled hybrid four-
16 wheel drive cost of around \$28,000 -- these are
17 round numbers. So, it cost more. It gets about
18 the same acceleration, 12.0 versus 11.8, but it
19 gets a significantly improved miles per gallon, an
20 increase of about 83 percent going from 18 to 33
21 miles per gallon in the city and about 32 percent
22 going from 22 to 29 miles per gallon on the
23 highway.

24 It does have a slightly larger passenger
25 volume, slightly reduced cargo volume, and quite a

1 reduced maximum towing weight in pounds, a
2 thousand versus 3,500 pounds.

3 Other size components, length, width,
4 height are identical.

5 Over here in this column is a hybrid
6 two-wheel drive. Again, we are comparing it to a
7 four-wheel drive over here in this column. It
8 costs about the same amount of money. It has a
9 little bit better acceleration, 0-60, gets 100
10 percent, doubles the fuel economy. It goes from
11 18 to 36, so everybody deciding to buy a two-wheel
12 drive hybrid Ford Escape would in fact achieve our
13 goal of doubling fuel economy for that particular
14 purchase on the city and about a 40 percent
15 increase on the highway. Combined about a 65
16 percent increase.

17 Again, it has a slightly greater
18 passenger volume, slightly smaller cargo volume,
19 and a reduced towing capacity.

20 Now, which one is the hybrid. There are
21 three photos here. One of these three is the
22 hybrid. From the outside, the main point of this
23 slide is from the outside you can't tell the
24 difference.

25 Let's look at the 2005 Honda Accord.

1 Let's take a look at a full-size sedan now. This
2 time I am showing an in-line four cylinder here in
3 the right column. In the middle is a V-6. Those
4 two are the conventional configurations, and the
5 hybrid configuration is over here in this column.

6 Notice again there is an increase in the
7 manufacturers suggested retail price. In this
8 case, there is quite a bit of improvement in
9 acceleration, 7.5 for the hybrid versus 8.0 for
10 the V-6, versus 9.4 for the In-line 4 in the 0-60
11 acceleration. It is quite a peppy vehicle.

12 Miles per gallon. City miles per gallon
13 increases about 25 to 43 percent depending upon
14 whether you are comparing it to the In-line 4
15 which is the 25 percent or the V-6 which is the 43
16 percent.

17 It goes from 21 to 24 up to 30 for the
18 city, and it goes up from the low 30's to 37 for
19 the highway, combined about 33 versus 24 or 29.

20 Significantly -- good highway range, a
21 bit of an increase as to the previous vehicle.

22 The gross vehicle weight is a little bit higher
23 for the Accord as it was for the Ford. Passenger
24 volume is a little bit bigger. Trunk volume in
25 this case is a little bit smaller, although they

1 say they need a minimum of about ten, so they are
2 above that. They are at 11.2 versus 14 for the
3 conventional.

4 There is no spare tire on this vehicle,
5 but they provide a device to repair and inflate
6 the tire if you get a flat tire on the road. It
7 is some kind of goose up that you stick in and
8 then you inflate it with a compressor. Again, the
9 length, width, and the height are the same as the
10 conventional configuration.

11 This shows the hybrid along side a
12 conventional gasoline configuration in 2005. From
13 the exterior, there is no difference.

14 Looking at some sample technologies that
15 could be used to further improve new vehicles.
16 You can do things like phasing the cam, you can
17 improve the transmissions and get small
18 improvements for these, you can deactivate the
19 cylinders. Some cylinders, for example, a V-8,
20 operating on just four cylinders when it is in
21 cruise-mode on the freeway, and you can get around
22 3 to 6 percent efficiency improvement.

23 Some of these technologies are on the
24 road today. There is variable valve timing for 6
25 percent gasoline direct injection, 49 percent turbo

1 charging, 6 to 8 percent in some cases. Some
2 would argue that you can turbo charge and downsize
3 the engine and get further improvements.

4 Improved compressors for air
5 conditioners can give you some improvement. Using
6 cam-less valves where you basically take the cam
7 shaft out of the engine and drive the valves with
8 a little electric motors can give you 11 to 16
9 percent, and then there is advanced diesel engines
10 and electric hybrid drive trains can give you
11 around 30 to 50 percent improvements.

12 Those are all rough numbers, approximate
13 numbers. In a particular application it will
14 vary, and these are not necessarily cumulative
15 improvements.

16 Now, we are starting to look at the
17 question of can we build a multi-state coalition.
18 California is one of 50 states, we only have two
19 votes in the Senate out of 100, so we need all of
20 the other states to work together with us.

21 The Alliance of Auto Manufacturers in
22 their suite to the Air Resources Board last week
23 or the week before, they say a national fuel
24 economy standard makes sense implemented through
25 NHTSA, National Highway Transportation Safety

1 Administration.

2 They say fuel economy should improve,
3 but we should balance safety, jobs, and other
4 factors. I personally would agree with that.

5 The regulations should provide for
6 social benefits that are worth their costs.
7 Again, I would agree.

8 Our last point that they make is that
9 advances should be based upon consumer demand and
10 not on regulations. At the same time of course,
11 consumer demand is driven by -- borrowing a line
12 from Commissioner Boyd, consumer demand is driven
13 by advertising that we see, and a lot of that
14 advertising of course is paid for by the auto
15 manufacturers, and they have their interest and
16 profit centers in certain vehicle classes, and
17 that is of course what they promote.

18 I agree that advances should be based
19 upon consumer demand. To the degree that the
20 consumer demand isn't transparent, there may be
21 need for regulation, so I might disagree with that
22 a little bit on the bottom there.

23 PRESIDING MEMBER GEESMAN: Let me ask
24 you on that, Gerry, what about the extent to which
25 consumer demand, which is really focused on those

1 people in the market for a new car today, varies
2 from public opinion, which represents that the
3 broader universe of people -- seems to me that
4 everybody ends up being affected by increased
5 volatility in gasoline prices.

6 What if you do have a fairly substantial
7 variance between public opinion and that smaller
8 universe of new car purchasers. Which should
9 prevail in that circumstance?

10 MR. BEMIS: You know what I think we
11 need to do is we really need to mount a massive
12 consumer education campaign.

13 Think of the many many dollars being
14 spent by Madison Avenue in trying to promote
15 certain vehicles and vehicle classes. We have
16 nothing to compare to that. I have talked with
17 one particular consumer -- this is a kind of
18 interesting little side note.

19 This is a woman who said I have heard
20 about the Toyota Prius. It sounds really
21 interesting to me, but I just don't want to suffer
22 from the reduced driving range. She didn't
23 realize it has a better driving range. That is
24 why I put those other attributes on the slides
25 that show you have an increased driving range. It

1 is not a sacrifice. That is the whole point.

2 I think we need to go for a massive
3 consumer education program that will let people
4 know that you don't have to sacrifice vehicle
5 attributes in order to have a well-performing
6 vehicle.

7 In all fairness, I did point out a few
8 compromises in the current offerings that I showed
9 here, the reduced towing capacity for the Ford
10 Escape and the lack of a spare tire which could
11 influence some people. For example for the Honda
12 Accord, and of course there is an increase in
13 price.

14 I think we would need to mount a very
15 massive consumer education effort to overcome the
16 misconceptions that we see out there.

17 PRESIDING MEMBER GEESMAN: Even without
18 that public education effort, the Public Policy
19 Institute of California has shown pretty
20 consistently overwhelming majorities in California
21 supportive of pretty substantial increases in CAFE
22 standards. I don't know what similar surveys
23 would show elsewhere, but I think at least among
24 the public in our state, there is pretty strong
25 and I think pretty one-sided sentiment on this.

1 MR. BEMIS: I hope that is true. I
2 certainly do understand it from our perspective.
3 It makes a lot of sense to move forward.

4 This is a report that came out in I
5 think just this month, the National Commission on
6 Energy Policy which is a bi-partisan group
7 advocates for significantly strengthening
8 passenger fuel economy by the year 2010. We use
9 2008 in our petroleum dependence work in 2076.

10 Reform CAFE to reduce costs, that means
11 on both sides. Invest in highly efficient hybrid
12 advanced diesel vehicles and accelerate the use of
13 domestic bio-fuels. Those were their major
14 recommendations in a report that just came out.

15 Finally here, this is a bit of an
16 updated slide from what was in the handout. It
17 shows the states order from highest price to
18 lowest price in the average 2003 annual average
19 prices.

20 In the handout I showed before, I just
21 had the green and the blue/gray slides, but since
22 we produced that, I have continued to contact
23 states, and you can see now that I have contacted
24 roughly half of the states.

25 Starting with the higher priced states,

1 and one of the things that I found remarkable in
2 preparing this slide is there is not a huge range
3 in the annual average price for most of the states
4 on the order of \$1.20 to \$1.40 all but five or six
5 of the highest states.

6 So, this addresses the question of would
7 all the states advocate for the same degree of
8 improvement. Maybe not because the prices are
9 higher in some states like Hawaii, Alaska, and
10 California than it is in Texas, Louisiana, and
11 Georgia.

12 I think all of the states are suffering
13 from high fuel prices, and they should all support
14 some degree of CAFE improvement. So, they may
15 disagree on how far we should go, but I think most
16 states should be willing to join this effort. I
17 intend to use a red to show the states that have
18 said no, and there is no red. Not a single state
19 has said no, and I find that pretty encouraging.

20 We have just begun to initiate contact
21 trying to find out who is the right person to talk
22 to each one of the states. The states that
23 indicated they definitely want to be involved, I
24 have indicated here in green.

25 Finally, here is a map showing the

1 states. Although this map is a little older, it
2 doesn't show all the states, all the yellow. I
3 used the same color scheme, green for the ones
4 saying yes, and yellow for the ones saying maybe.

5 I believe if we continue this effort, we
6 will need to find out how far can we go, how far
7 are the states willing to go and to what degree do
8 they want to join a formal versus an informal
9 group.

10 I think we are going to need to do our
11 homework between now and the next cycle which is
12 in 2006, as I understand it, for light trucks to
13 find out what questions do we need to have answers
14 to, what questions do we need to anticipate the
15 auto manufacturers to raise about jobs and cost
16 effectiveness and things like that.

17 I think we need to go to Congress with
18 answers to those questions. That is what we need
19 to work on. I would appreciate any additional
20 insight or comments that anybody has on how we can
21 best build this coalition and what kind of
22 questions do we need to answer before we go to
23 Congress so that we have those answers in our hip
24 pocket when we do that.

25 I think we need to move it one time

1 where all states, if they individually go to
2 Congress, they are going to probably get dispersed
3 and diffused, and there is not going to be a
4 critical mass. If we all act at once and go to
5 Congress at the same time, I think we can actually
6 do something. Thank you.

7 PRESIDING MEMBER GEESMAN: Thank you,
8 Gerry.

9 Why don't we go to the alternative fuels
10 and new technologies area. The first speaker that
11 I have on my list is Randall von Wedel.

12 MR. FONG: I just got a note from Mr.
13 von Wedel. He has been delayed and won't be
14 arriving until a little bit after 11:00, so we can
15 skip to the next person on your list.

16 PRESIDING MEMBER GEESMAN: That is Tom
17 Koehler, Renewable Fuels Partnership.

18 MR. KOEHLER: Thank you, Commissioners
19 for the opportunity to present today. My name is
20 Tom Koehler, and I am with the California
21 Renewable Fuels Partnership.

22 I wanted to give you just a brief update
23 of where things are in this state in terms of
24 ethanol and touch on some of the issues.

25 The partnership is a coalition of

1 agricultural, environmental, local governments,
2 and renewable advocates all looking to increase
3 the amount of renewable fuel used and produced in
4 the state.

5 Currently, there are six to eight
6 projects in advanced stages of development
7 throughout the state really from the south all the
8 way up to the north.

9 Three of these projects have fully
10 permitted sites, one is construction while we
11 speak. Combined, they represent a capacity of
12 around 400 million gallons.

13 This is what I would term as the near-
14 term projects, mostly from conventional
15 feedstocks. It is very exciting. These projects
16 will then help spur the next phase of development
17 which will be the cellulosic development in
18 California where we can not only go to 400 but go
19 up to in excess of three billion gallons and
20 actually be an exporter of renewable fuels.

21 I want to talk a little bit about the
22 economic development because Mr. Boesel at
23 CalStart mentioned the opportunity in all
24 alternative fuels for jobs.

25 Ethanol production is a job creator of

1 maximum proportions. If you look at the ethanol
2 production that has happened across the country,
3 essentially, for every 40 million gallon plant,
4 you are going to create around 700 jobs, new jobs
5 throughout the economy.

6 This first phase if you take these
7 studies and extrapolate them to California could
8 produce 7,000 new jobs, stimulate over \$600
9 million in capital investment, and as importantly,
10 provide economic development in areas that are
11 much needed throughout the state.

12 As far as the environmental issues are
13 concerned, there are quite a few positive issues.
14 Probably the most is the reduction of CO2. In an
15 MIT report that was commissioned by the Pew Center
16 for global climate change states that renewable
17 fuel such as ethanol are actually the most cost
18 effective short-term reduction strategy for CO2.

19 The reason being is because there is no
20 need for new infrastructure, and we could get
21 these fuels into the whole system right off the
22 top of that.

23 The Pavely bill, the Pavely approach is
24 absolutely 100 percent necessary, and it is a good
25 strategy. It will take some years for that to pay

1 off. In the short-term, we can get reductions
2 right now.

3 Ethanol reduces carbon monoxide, which
4 is an important ozone precursor. It is clean
5 replacement for aromatics and other gasoline
6 components. It meets the clean air requirements
7 by law of California.

8 Permeation was brought up, and it
9 actually was not an unexpected result, it was as
10 ethanol went through the review, California Policy
11 Environmental Review, permeation was flagged as an
12 issue. It was actually put into the California
13 RFG3 specs to be offset.

14 What these new tests are showing is that
15 potentially, the offsets that were included in the
16 RFG3 are not enough and so adjustments need to be
17 made.

18 A couple of things to remember about
19 permeation when you talk about permeation.
20 Permeation is not caused by ethanol. Permeation
21 is caused by aromatics in the gasoline. Ethanol
22 is a clean replacement to aromatics. So, as the
23 aromatics go down, so too will the permeation.

24 Permeation is an issue that is declining
25 over time. New cars -- basically, the issue is

1 very very small in new cars.

2 As the other issue about permeation is
3 that the research shows that the permeation effect
4 at a 5-7 blend is roughly the same as it is with a
5 10 percent blend. What that says is that the most
6 cost effect strategy actually for dealing with
7 this issue and mitigating the existing emissions
8 might well be increasing our blends to 10 percent,
9 which would be a good thing because it would line
10 our air quality regulations with our energy and
11 CO2 regulations as well.

12 This is from the California Energy
13 Commission website. Just to highlight some of the
14 recent price activity. The line down below in
15 blue is the price of ethanol. The other two lines
16 up above are CARBOB and alkylates. Ethanol is
17 providing additional volume at savings to the
18 market, savings to the consumers.

19 When we are talking about the price of
20 ethanol, it is only one aspect of it. There are
21 numerous reports that you have all read talking
22 about the elasticity of supply and what an
23 incremental volume will do in terms of either
24 going away increasing prices or come into the
25 market and helping keep prices down. Ethanol is

1 providing that in a very large way right now at
2 5.7 percent of the market. It can be 10 percent.

3 As you proceed in this process, some of
4 the issues to consider from our viewpoint is that
5 Energy Commission has a track record and a road
6 map that it set on electricity in terms of
7 renewables. Looking to that as a model for fuels
8 is highly appropriate, a portfolio standard of all
9 sorts of alternative fuels, some sort of funding
10 mechanism to add to that.

11 We don't have to reinvent the wheel. It
12 has been invented right here for electricity. It
13 has been successful, and I think it just needs to
14 be transferred over to transportation fuels.

15 Ethanol is a key building block to
16 renewable hydrogen. There has been lots of talk
17 and excitement about hydrogen. I think everyone
18 will agree that the hydrogen promise -- the
19 promise of hydrogen cannot be filled unless there
20 is significant renewable portion to it. Ethanol
21 today is the most cost effective way to get to
22 renewable hydrogen.

23 We talked about the additive supply and
24 talked about the local supply, which again is part
25 of the promise of ethanol in California is

1 actually having the supply here. There will most
2 likely never be another oil refinery built in this
3 state. We are trying to keep them from shutting
4 down. There can be many bio-refineries built in
5 this state, all across the state.

6 Another issue in that regard and it has
7 been well documented in other proceedings, there
8 is an issue with the ports and the transportation
9 of the fuel coming in. I would say that ethanol
10 adds a significant amount of volume without
11 putting more traffic into that system,
12 particularly when it is local, but even today when
13 it is coming in for the rails. It is the supply
14 diversification on a transportation logistics is a
15 key aspect to ethanol as well.

16 Brazil, I think, is something we would
17 want to look at in a very close way. They have
18 had a very successful program. You go to Brazil,
19 and there is you have basically there is 22
20 percent ethanol in the gasoline, or there's 100
21 percent.

22 They have been doing it now for ten to
23 fifteen years. It is something we ought to look
24 at and see what lessons we can learn.

25 One of the most exciting things about

1 Brazil right now is that every single car sold in
2 Brazil is a FFV, so it can go on either 100
3 percent gasoline or 100 percent ethanol. Those
4 cars are sold at no additional cost to the
5 consumer. As we wake up fifteen years from now,
6 ten years from now, twenty years now, and we
7 really do have an emergency, actions that are
8 taken today or not, will determine whether we can
9 turn the switch and have successful fuel
10 switching.

11 I would suggest that one key aspect in
12 terms of bio-fuels and potentially on these other
13 fuels as well is looking at an aggressive FFV
14 program and how we actually make it happen. If
15 Brazil can make it happen at no cost, then why
16 can't we? If they really are no cost, then
17 shouldn't that be a policy and an implementation
18 goal.

19 PRESIDING MEMBER GEESMAN: Do you know
20 what the air quality experience in Brazil has
21 been?

22 MR. KOEHLER: No, off the top of my
23 head, no, I do not.

24 PRESIDING MEMBER GEESMAN: I think if
25 you could provide us or the industry could provide

1 us with any major data from Brazil, be it on this
2 permeation issue or contribution to ozone or
3 anything of that sort, it would be helpful to us.

4 MR. KOEHLER: Absolutely. I would be
5 happy to do that.

6 I will say on the measured data that we
7 have today, 2004 as was mentioned was the cleanest
8 year on record. There was a presentation by ARB
9 staff to the Board just last week or so going
10 through the air quality issues.

11 2004 on the South Coast was an average
12 weather year. It wasn't below average, it was
13 average. 2003 the weather was conducive to ozone
14 forming. Across the state, the state saw the
15 lowest ozone exceedances that it has in history.
16 I will say that 2004, as you were well aware, was
17 the first year of 100 percent implementation of
18 ethanol in the gasoline.

19 While these issues are complicated and
20 there are all sorts of balancing going on between
21 the fuel components, we actually think that
22 ethanol is helping reduce the ozone. If you take
23 the data as it looks, 2004 would indicate that it
24 is either helping or certainly not hurting and
25 shouldn't be a roadblock to its aggressive

1 implementation.

2 That is a good segue into the second to
3 the last point here which is --

4 COMMISSIONER BOYD: Tom, before you
5 leave that point on FFV. I think you've heard me
6 speak before, one of my pet peeves is that there
7 are several hundred thousand FFV's running around
8 California that accomplished for the manufacturers
9 getting CAFE credits with the full knowledge that
10 there is absolutely no fueling infrastructure in
11 the State of California to take advantage of that.

12 I don't know if my grievance is with the
13 auto industry or the fueling industry, but we
14 already have that dilemma, so I guess your point
15 is well taken.

16 MR. KOEHLER: As is yours. I would
17 personally 100 percent agree with your pet peeve
18 on that in terms of CAFE credits for vehicles that
19 are not used with the fuel that they are not
20 getting their CAFE credits on.

21 I believe that we can have these cars
22 and should have these cars without sacrificing
23 CAFE credits. Every car today in California is
24 flex fuel up to 10 percent. My point was that as
25 we wake up ten years from now, it would be great

1 to have every car in California flex fuel up to 20
2 percent, 30, 40, 50 to give us full flexibility.

3 The last two points are really
4 interrelated. Just that the 2076 report I thought
5 was a great step in working with ARB. They
6 produced a great report, now ARB is off and
7 running and do all sorts of fuel regulations
8 whether it is diesel or gasoline or fleets. It is
9 just important that the energy and air quality
10 consciously get integrated. I would say that we
11 do not have that right now.

12 We have it in kind of an intellectual
13 way, but we do not have it on the ground in a
14 regulatory approach. That is very much needed.
15 To the degree specifically to ethanol, what is the
16 one thing that would make a large difference today
17 is a fungible system where any amounts of ethanol
18 from 0 to 10, so get Paul Wuebben and he can drive
19 around in his car with 0 if he wants to, but also
20 those who want to go to 10 for market reasons as
21 well can be able to.

22 There is of course that creates a
23 challenge of how to do that to make sure that it
24 is done in a way that all the air quality is
25 protected. There is no question in my mind that

1 it is doable, and it ought to be a goal and could
2 serve the energy supply purposes of this state in
3 a great way if we make that happen.

4 PRESIDING MEMBER GEESMAN: What was your
5 reaction to Mr. Wuebben's discussion of
6 seasonality?

7 MR. KOEHLER: I don't think it is
8 necessary, and there will be no plants built in
9 this state if all you are talking about is a six
10 month market. Essentially, I don't think it is
11 necessary. I think this air quality issue can be
12 resolved. It is complicated, but it is less
13 complicated than you probably think.

14 We have achieved a lot of other more
15 complicated things in our life, so it is not a
16 show stopper, and the state can design a fuel that
17 uses 10 percent ethanol that reduces our air
18 pollution, and it can be used year round. There
19 are so many reasons that it should be, that we
20 ought to just roll up our sleeves and make it
21 happen.

22 With that, I would conclude that ethanol
23 and other bio-fuels along with the host of other
24 alternative fuels really are key components to
25 California's transportation future.

1 PRESIDING MEMBER GEESMAN: Tom, thank
2 you very much.

3 MR. KOEHLER: You are welcome.

4 PRESIDING MEMBER GEESMAN: The next
5 speaker is David Modisette.

6 MR. MODISETTE: Thank you,
7 Commissioners. I am Dave Modisette, the Director
8 of the California Electric Transportation
9 Coalition. It is a pleasure to be here today.

10 I am going to go through this quickly.
11 There is a lot of information here, but I would be
12 happy to sit down with you or with staff at a
13 later date and go through particularly some of the
14 technical analysis that I am going to be
15 presenting.

16 The purpose of this slide is simply to
17 say that I am not here to talk about electric
18 cars. Electric technologies are many, they are
19 actually quite diverse, they have quite a few
20 applications, and I'm going to present quite a few
21 of those to you today.

22 The unique thing about electric
23 transportation displacing petroleum is that it
24 does tend to provide benefits across quite a few
25 sectors, reduce criteria pollutants, toxic air

1 contaminants, reduce greenhouse gases, obviously
2 reduce petroleum dependent, lower energy costs for
3 consumers because electricity is less expensive
4 than gasoline or diesel, and to the extent that
5 electric technologies are included into the
6 regulatory environment, more compliance
7 flexibility for businesses that have to meet air
8 quality regulations and lower compliance costs for
9 businesses.

10 What is driving the markets for these
11 electric technologies? Well, it does vary by
12 technology. There is not one single thing, there
13 are a combination of factors. I guess first of
14 all, air quality regulations and incentives is
15 also a key driver today. Historically indoor air
16 quality. A lot of the forklifts, you know,
17 industrial vehicles were concerned about worker
18 health, so indoor air quality was a major issue.

19 Economics. For some of these
20 technologies, the technologies are not only less
21 costly over their life cycle, but also initial
22 cost is less. Recently technological developments
23 in these areas has spurred additional development.

24 In the future, we think that needed
25 reductions in greenhouse gases and in petroleum

1 dependency are also going to be key market
2 drivers.

3 PRESIDING MEMBER GEESMAN: Similar to
4 air quality, a regulatory requirement?

5 MR. MODISETTE: Yes, OSHA-type
6 requirements.

7 Some electric technologies already have
8 significant market share. There is over 300,000
9 non-road electric vehicles in California today, so
10 we believe the future potential is large as are
11 the benefits to California.

12 We have already talked about truck stop
13 electrification has been mentioned today. The ARB
14 estimates that there are at least 67,000 sleeper
15 cabs in California idling at truck stops for up to
16 16 hours a day in multiple shifts. One solution
17 is truck stop electrification. You may be
18 familiar that there are two categories of
19 technologies in this area.

20 First is the off-board technology, which
21 as you can see provides heating ventilation, air
22 conditioning through that long tube that comes
23 down into the cab of the truck. The beauty of
24 this system is that there is no additional
25 equipment required on the truck. It is entirely

1 self-contained, and any truck can use it.

2 The second photograph there is out at
3 49-er truck stop here in Sacramento. It is a
4 surepower system which provides electricity,
5 either 120 volt or 240 volt so you actually plug
6 in the truck. This system does require it to have
7 on-board electric air conditioning and heating.
8 The top system is more expensive, the bottom one
9 is less expensive.

10 I guess the thing I really want to kind
11 of call to your attention, all of these slides are
12 the potential numbers which we hired TYAX to
13 calculate two years ago. We are updating these
14 numbers now, and we will have those for you by
15 late January or February.

16 The striking thing about this is that
17 the potential, reasonable potential in 2010 for
18 just truck stop electrification alone, is almost
19 30 tons per day reduction in NOX and ROG. Those
20 of you who follow air quality regulation,
21 obviously Commissioner Boyd knows this very well,
22 is anything really over a ton per day is something
23 that air quality agencies are scrambling to
24 achieve.

25 Something that can provide 30 tons per

1 day reduction for a single technology is almost
2 unheard of today in air quality regulation.

3 In terms of petroleum reduction, this
4 potential could displace 45 million gallons of
5 diesel annually.

6 Electric transport refrigeration units,
7 these are refrigerated containers and refrigerated
8 trucks. This is a dual-fuel technology which uses
9 a small diesel engine while the truck is on the
10 road, but when it comes to a warehouse or a
11 refrigerated shipping dock, it plugs into an
12 electric infrastructure which is there and can
13 provide the environmental benefits of the
14 electricity while it is stationary.

15 The ARB estimates that there is between
16 4,000 and 7,000 of these in California today,
17 mostly refrigerated ocean going shipping
18 containers. 2010 potential reduction, twelve tons
19 per day of NOX and ROG reduction and displacing 30
20 million gallons of diesel annually.

21 Marine terminal technologies are
22 becoming quite popular today. That is because
23 when a ship pulls up to the dock, it may shut down
24 its main engines, but it continuous to run
25 auxiliary diesel engines for what is called the

1 "hotelling loads". This might be a refrigeration,
2 heating/air conditioning, other types of
3 mechanical loads, and just one ship at the dock,
4 and it is four tons of pollutants. Sixteen ships
5 is equal to the emissions of a million cars.

6 Traffic in this area is increasing at a
7 very very rapid pace. The alternative here is
8 when that ship is at the dock, you essentially
9 plug it in and use electricity for those hotelling
10 loads while it is at the dock. There are actually
11 four of these installations on the west coast
12 today, and one at the Port of Long Beach which is
13 pending. Again, a great deal of interest among
14 air quality regulators and the ports in this area.

15 2010 potential, about nine tons per day
16 of NOX reduction, fourteen tons of SOX reduction,
17 displacing 30 million gallons of diesel.

18 PRESIDING MEMBER GEESMAN: How did you
19 calculate that potential. What scale up of
20 current penetration did you assume?

21 MR. MODISETTE: Most of the ports are
22 analyzing this, and what they are trying to
23 identify are what are called the frequent flyers,
24 that is the ships that are coming to California
25 and docked at one or more California ports at

1 least ten times. It is those frequent flyers that
2 they think are going to be the cost effective
3 applications, ships that are coming just one or
4 two times a year are not going to be cost
5 effective. They are trying to find shipping lines
6 that have frequent flyers and where it is going to
7 be a cost effective reduction, both to provide the
8 equipment on the dock as well as the equipment on
9 the ship.

10 PRESIDING MEMBER GEESMAN: Is that
11 perceived as a voluntary action or a mandatory
12 action?

13 MR. MODISETTE: It is voluntary today,
14 but the ARB has an aggressive regulatory
15 investigation, and there will be a regulatory
16 proceeding in 2005. I guess it varies quite a
17 bit. The Port of Los Angeles installation with
18 China Shipping Lines that was just completed was a
19 result of court action between the environmental
20 groups and the City of Los Angeles.

21 It is a situation where there is
22 tremendous pressure on the ports to reduce air
23 pollution. You probably heard that the port
24 complex in the Los Angeles area is the single
25 largest source of air pollution in the South Coast

1 Air Basin, so there is tremendous pressure on them
2 to reduce air pollution. I think it is either
3 going to be voluntary action on the part of the
4 ports or I think air quality regulators at both
5 the state and the local level are going to step in
6 and regulate those emissions.

7 Electric lift trucks. There is already
8 a significant market share, about 60 percent of
9 the market for these lift trucks are electric. I
10 guess the striking thing about this is that
11 replacing just one ICE, internal combustion engine
12 lift with an electric is like taking between 16
13 and 170 cars off of California roads. The reason
14 for that is quite simple. That is until very very
15 recently, I think 2002, these engines were
16 completely uncontrolled. There was absolutely no
17 controls or requirements on these engines. So if
18 just relatively small numbers of these vehicles
19 can produce large emissions benefits. 2010
20 potential between 7 1/2 and 11 tons per day
21 displacing 300 million gallons of fuel annually.
22 The reason why this displacement number is so
23 large is that many of these are run in three eight
24 hour shifts, 24 hours a day used quite a bit.

25 PRESIDING MEMBER GEESMAN: Again, in

1 measuring the potential there for 2010 are you
2 contemplating simply voluntary shift or a
3 mandatory one?

4 MR. MODISETTE: For our 2010
5 projections, this is what we call a reasonable
6 maximum feasible scenario. So, I would say that
7 it is aggressive action either with regulatory
8 action or with incentives. In this case, the case
9 of the forklifts, the ARB does have an on-going
10 proceeding that is going regulate the end user
11 fleets, anybody who has four of these forklifts
12 are more, is going to be subject to an end user
13 fleet average, which is going to be increasingly
14 stringent where they can use electrics to meet
15 that fleet average. There is an engine
16 manufacturers fleet average which is going to kick
17 in about 2010 as well.

18 I should also add, though, that all of
19 these technologies are eligible under the newly
20 funded or expanded funded Moyer program. The
21 incremental cost of all of these is eligible, and
22 I think as a result of that, you are going to see
23 increased voluntary penetration before the time
24 that some of the regulatory requirements kick in.

25 Airport electric technologies. These

1 are bag tugs, belt loaders, push back tractors,
2 and preconditioned air units. Some airports have
3 used these quite aggressively, such as the Denver
4 Airport is almost 100 percent electric.

5 In the South Coast, there is a
6 memorandum of agreement between air quality
7 agencies and the six airports there. Although,
8 the percentages of electric so that they have to
9 acquire are relatively modest. So, 2010 potential
10 is still significant, three tons per day. In this
11 case, we have not calculated the diesel
12 displacement, although we will do that for our
13 update.

14 PRESIDING MEMBER GEESMAN: Let me ask
15 you, Dave, on all those calculations, would it be
16 easy for you to make calculations of particulate
17 reduction as well?

18 MR. MODISETTE: In some cases we have
19 done that in the 2002 analysis we have done that.
20 For the update we are going to do, we are going to
21 do particulate numbers.

22 PRESIDING MEMBER GEESMAN: Good.

23 MR. MODISETTE: Burden and personnel
24 carriers and turf trucks. These are little mostly
25 industrial vehicles. They have significant market

1 share, about 40 percent today. We really haven't
2 talked about any kind of in-state economic
3 development benefits, but the upper truck there
4 made by Taylor-Dunn is made in Southern
5 California. 2010 potential, still significant
6 about three tons per day, displacing 60 million
7 gallons of fuel annually.

8 Sweepers, scrubbers, varnishers. Very
9 very large market share, although they is still
10 significant potential, even in this market.

11 Lawn and Garden Equipment. Much to our
12 surprise, the ARB did an inventory of lawn and
13 garden equipment just a couple of years ago and
14 discovered that the residential market is now 38
15 percent electric over seven million pieces of
16 electric lawn and garden equipment out there today
17 including cordless and corded leaf blowers,
18 trimmers, shredders, chain saws, mowers.

19 Four of the major air districts have
20 very very popular incentive programs where they
21 scrap an existing gasoline mower and provide a
22 voucher for an electric mower. In fact, in 2004
23 here in the Sacramento District, they had enough
24 money for 600 vouchers for this kind of scrap and
25 buy program.

1 Now they advertise this on-line and
2 through phones. They committed all 600 of those
3 mowers in 19 minutes, so it is an extremely
4 popular program. We think this concept with this
5 concept of scrap and buy could be extended these
6 other types of equipment besides just the mower.
7 So, 2010 potential, seven tons per day and
8 displacing 110 million gallons of gasoline every
9 year.

10 On road zev's. I guess this is just a
11 reminder that there still are quite a few low
12 speed vehicles, and there is still a market for
13 low speed vehicles in California, about 10,000 of
14 those. There is also about 500 zero emission
15 busses and shuttles in California.

16 Plug-in hybrid vehicles. The way to
17 think about this is this an engine dominant
18 hybrid, such as the Prius today. You put a little
19 larger battery pack in it, you give it the ability
20 to be plugged in. Not the requirement, but the
21 option to plug in. With that, you can get between
22 20 and 60 miles of all electric range on that
23 vehicle. It was already mentioned that there is a
24 demonstration that is being done with EPRI and
25 Daimler Chrysler in the South Coast District and

1 early next year they are going to be providing
2 five of these prototype sprinter vans here in
3 California.

4 I guess the thing that a lot of people
5 think and say to me when I talk about this, they
6 say well, gosh, the existing hybrids today like
7 the Prius, they are really at the top of our most
8 stringent emission standards. They are in the ATP
9 zev category. That is the most stringent standard
10 for gasoline vehicles, so obviously we can't do
11 any better in terms of emissions than today's non-
12 plug hybrids.

13 That is just not true as these numbers
14 show. We could get between 25 and 55 percent
15 additional reduction in NOX and ROG from today's
16 no-plug hybrids, 35 to 65 percent additional
17 reduction in greenhouse gasses, and between 40
18 percent and 80 percent additional reduction in
19 petroleum if you had a plug-in option on some of
20 these vehicles.

21 Fuel cell vehicles. Obviously, these
22 are electric-drive vehicles too. I think the
23 reasons for showing this slide is simply say that
24 all of the utilities today are actively involved
25 in fuel cell demonstration both on the vehicle

1 side and on the infrastructure side. this is an
2 area that we are working on, although we are not
3 forgetting the other kind of electric technologies
4 that are available in the near term.

5 Let me just kind of add up the numbers
6 now of the technologies that I have already showed
7 you. You can see estimated reductions of NOX and
8 ROG in the 2010 to 2015 time frame of between 87
9 and 166 tons per day. Again, these are just huge
10 numbers in terms of air quality reduction in
11 California and additional air quality of reduction
12 beyond what is being captured today. Estimated
13 gallons of fuel displacement in the same time
14 frame, between 905 million and 2.3 billion gallons
15 displaced just by these few electric technologies.

16 Recommendations. I guess this is my
17 last slide. I will start with the broadest
18 recommendation. As some people have mentioned,
19 you know, we have very very good goals in the
20 transportation sector set by the Energy
21 Commission, the ARB. We have very good
22 environmental goals in terms of criteria
23 pollutants and particulates.

24 Some goals for greenhouse gas reduction
25 on the light duty side, we have good goals. What

1 we don't have is a California Transportation Fuel
2 Strategy and Implementation Plan to actually
3 achieve those goals.

4 That is our over-arching recommendation
5 is we need to have some kind of a plan just like
6 we do with other areas in environment, in
7 renewable portfolio standard, and the electricity
8 generation sector. We need to have a plan to
9 start implementing some of those goals.

10 Secondly, to include off-road or non-
11 road fuel use and alternatives. I think it is a
12 mistake just to focus in the on-road sector.
13 Certainly, you can't ignore that sector, but to
14 ignore a very very large sector fuel use, we think
15 would be an error.

16 Count all the impacts, the benefits,
17 criteria pollutants, particulates, CO2, and fuel
18 diversity. For the electric alternatives, we
19 think it is essential that you encourage load
20 management and energy efficiency activities and
21 programs. We don't want to create new problems
22 while we are solving air quality issues.

23 We would go so far as to say that the
24 electric transportation and goods equipment issues
25 and technologies, and impacts should even be

1 included as part of the energy efficiency and load
2 management sections of the energy action plan.

3 Again, this is an area where the penetration of
4 these technologies is not just driven by market
5 forces as it is in many other areas, but is driven
6 by air quality regulation and other things. We
7 think that needs to be specifically acknowledged
8 and reflected in the energy action plan.

9 Lastly, just continue to organize and
10 work with stakeholders on an on-going basis to
11 develop and implement policies, programs,
12 incentives, information, and funding.

13 With that, thank you very much. I'll be
14 happy to answer any questions.

15 PRESIDING MEMBER GEESMAN: Thank you
16 very much, Dave. That is quite helpful, and we do
17 look forward to the update of your data you
18 mentioned would be coming in a few months.

19 COMMISSIONER BOYD: Thank you, Dave. It
20 is always good to see someone else who has not
21 given up on electric transportation.

22 PRESIDING MEMBER GEESMAN: I guess I
23 would add particularly with respect to that energy
24 action plan comment that properly done, it would
25 seem these technologies do offer a pretty good

1 load management opportunity. I think we might be
2 able to see some benefits on the electricity
3 demand side where we seem to be so driven by our
4 peak loads, which are increasingly needle peak
5 loads that I would think that these technologies
6 could very well contribute to trying to level out
7 that load and allow us to meet our electricity
8 needs with a little bit more benign form of
9 electricity technology as well as a more benign
10 form of operating the existing electric
11 infrastructure we have.

12 MR. MODISETTE: Yeah, very very much so,
13 and we do have some experience in this area with
14 the electricity crisis, the Energy Commission
15 actually provided funding to some of the utilities
16 to do peak load shift programs. In fact, Ed Kjaer
17 is here from Southern California Edison today to
18 talk about his experience with load management and
19 energy efficiency with some of these technologies.

20 PRESIDING MEMBER GEESMAN: Again, I
21 thank you and I hope that you stay very much
22 involved in this process. We want to make it a
23 large focus of our efforts in '05.

24 MR. MODISETTE: Thank you very much.

25 PRESIDING MEMBER GEESMAN: The next

1 speaker is Andy Burke from U.C. Davis. Andy
2 Frank. I saw Andy looking nervously around the
3 audience and looked down at the name thing and
4 whoops.

5 MR. FRANK: Thank you very much for
6 allowing me to talk about this very important
7 topic of saving liquid fuel for gas for
8 California.

9 Obviously, people might come in here and
10 people say well, here comes Mr. plug-in. Perhaps
11 I have been one of the longest promoters of this
12 kind of concept, but it is beginning to look like
13 the rest of the world is finally coming around.

14 The plug-in hybrid vehicle is compelling
15 in the way it can reduce fuel consumption. Just
16 very clearly indicate to you the hybrid vehicle --
17 there are two kinds of hybrids.

18 The first is what the car companies are
19 doing now. They are hybrids that use electricity
20 that do not use electricity from the wall, but use
21 only gasoline. They get better gas mileage than a
22 number (indiscernible) and so on. It talks about
23 they get much better gas mileage, but they are
24 still using gasoline.

25 Plug-in hybrids, however, can use both

1 electricity from the wall and much less gasoline.
2 They get much better fuel economy and even better
3 than Dave Modisette referred to, even better than
4 the hybrids in all categories. Most important
5 thing, that is done by further down-sized engine.
6 The engine is down-sized to provide steepest road
7 conditions in the country.

8 These batteries then to store the
9 electric energy, we use batteries that are bigger
10 than the conventional hybrids. They are sized to
11 provide enough range for the vehicle between 20
12 and 60 miles.

13 Why do we choose 20 to 60 miles. The
14 average person in the United State actually only
15 drives about 30 miles a day. If you have a 60
16 mile range hybrid that you plugged in that can go
17 all electrically 60 miles, you will satisfy some
18 70 percent or so of the driving public. That 70
19 percent won't use any gasoline at all. You can't
20 save more fuel than that, liquid fuel.

21 Of course, you have to generate that
22 energy, and that energy of course comes from a
23 power plant. So, we will talk about plug-in
24 hybrids that have between 20 and 60 miles of all
25 electric range. As you might suspect, the more

1 batteries you have, the more benefits you are
2 going to have.

3 How do we reduce gasoline consumption.
4 We design -- the most important thing is -- we are
5 talking about cars and trucks -- you cannot design
6 a car and truck that does not have full
7 performance at all times. That is, when we design
8 a car, it's got to be able to perform the same,
9 whether the batteries or charged or not charged.
10 As a matter of fact, the hybrid, the current
11 hybrids designed by the car companies do that.

12 The plug-in hybrid is no different. It
13 will perform the same whether it is charged or not
14 charged. The most important thing is we drive all
15 electrically until the battery depletes to a
16 certain level, say 20 percent, then the system
17 automatically maintains the state of charge, thus
18 wall electric power is always used automatically,
19 and the person doesn't have to think about it.

20 We charge every night to full or nearly
21 full, use gasoline just like the Prius after the
22 20 to 60 miles of electric range has been used up.

23 The other most important thing, these
24 batteries are designed for a lifetime. That means
25 you don't have to change these batteries like in

1 your flashlight. Of course, these vehicles can be
2 designed for the way people use the cars.

3 To analyze these kinds of things, and I
4 think this is something that industry and well the
5 agencies have not been quite thinking of, maybe
6 you have been thinking of it, but anyway, we
7 should be thinking of annual liquid fuel
8 consumption. The analysis of these kinds of
9 vehicles cannot be done on a fuel economy basis,
10 but really should be done on annual basis.

11 In other words, you have one of these
12 plug-in hybrids. What you are concerned about is
13 how much liquid fuel have you consumed and
14 electricity have you consumed on an annual basis.

15 We can't talk about fuel economy as
16 such, we really need to talk about annual liquid
17 fuel consumption compared with a conventional
18 vehicle. This allows us to analyze dual fuel
19 systems such as electricity from the wall and
20 gasoline, and for cars less than 5,000 -- by the
21 way, just as a matter of interest, you remember
22 that electric cars when they were around, had all
23 kinds of fancy charging mechanisms. Why? That's
24 because they had to be filled up in a short length
25 of time.

1 However, for plug-in hybrids, we don't
2 need that. For plug-in hybrids, because you are
3 talking about charging over night, you can plug
4 into a 110-volts for a small car, less than 5,000
5 pounds or 220-volt for the bigger cars.

6 You don't need special infrastructure.
7 The standard GFI plus that are already in every
8 garage is all you need.

9 The cost of driving is about if you plug
10 in and you use electricity, and this is one of the
11 biggest bonuses of plugging in, is about one
12 quarter the cost of conventional gasoline vehicles
13 today.

14 The 60-mile range of plug-in hybrid can
15 reduce gasoline consumption to 10 percent of a
16 conventional cars on an annual basis. 20 mile
17 plug-in hybrids would reduce annual gasoline use
18 to about half the conventional vehicle. These
19 plug-in hybrids are a way to greatly reduce
20 gasoline consumption in a very short length of
21 time.

22 Here is picture 3 of eight vehicles that
23 we have constructed that all have 60 mile all
24 electric range plug-in hybrids. You are all
25 welcome to come by and visit us and go for a drive

1 in a couple of these vehicles. We actually have
2 three of them operational.

3 Just to show you that the technology is
4 here today and these vehicles are constructed by
5 students at UC Davis, and if we can do it, the car
6 companies can do a lot better. The reluctance to
7 build these things obviously comes from car
8 companies.

9 Let's take a look at the annual gasoline
10 consumption for 12,000 miles of driving. That is
11 kind of the average distance that people drive.
12 If you look at this slide, what I have in the
13 various columns is on the left column is a
14 conventional vehicle. In the next column to the
15 right is a conventional hybrid vehicles as
16 constructed by the car companies. We call that a
17 HEV-0 that means it has no electric range. Then a
18 20 mile electric range, and then 60 mile electric
19 range.

20 What the top green number is a full-size
21 SUV like a Chevrolet Suburban. The red triangle
22 is a mid-size SUV like a Ford Explorer. The
23 yellow bar is mid-size sedan like a Ford Taurus or
24 Chevy Lumina. The diamond is a compact sedan like
25 a Ford Focus.

1 We compared the annual gasoline
2 consumption if you can read that in terms of
3 gallons. I am sorry that is a little dark. The
4 conventional SUV for 12,000 miles uses about 850
5 gallons a year of gasoline. If you made a 60-mile
6 range hybrid, it would only use about 110 gallons
7 a year, so that is a dramatic reduction in
8 gasoline use.

9 Zero range hybrid full-size SUV would
10 use about 580 gallons, a 20 mile range would use
11 about 310 gallons, and then the 60 mile range
12 plug-in hybrid would only use about 120 gallons.

13 What is dramatic about this picture is
14 that the full size SUV uses about one quarter the
15 gasoline of a compact sedan today. So, this is a
16 slide that kind of shows that you can have your
17 cake and eat it too.

18 Greenhouse gas emissions. Here again we
19 have the conventional vehicle, the zero-range
20 hybrid, the 20 mile range hybrid, and the 60 mile
21 range hybrids, and the CO2 emissions of a plug-in
22 60 mile range full-size SUV is about two-thirds to
23 three quarters of the greenhouse gas emissions of
24 a compact conventional vehicle.

25 Incidentally, this includes, of course,

1 the greenhouse gasses generated in creating the
2 electricity to fuel these vehicles.

3 We heard a lot about diesels today.
4 Here is a picture that indicates the retail price
5 equivalent of these various hybrids, a
6 conventional vehicle on the left, zero range
7 hybrid, 20 mile range and 60 mile range hybrid.

8 According to an article from Ford, if a
9 conventional vehicle were dieselized, the
10 incremental cost for meeting 2007 standards is
11 indicated in the blue on this chart.

12 Notice that the point of this slide is
13 that a diesel, clean diesel, is more expensive
14 than a zero-range hybrid. In fact, if you use a
15 clean diesel, you may as well build yourself a
16 plug-in hybrid that's got 20 miles.

17 If you add a diesel to the plug-in
18 hybrid at 20 miles, you may as well build yourself
19 a gasoline 60-mile range hybrid. Incidentally,
20 you may notice that the red part in this slide is
21 the cost of batteries.

22 Of course, the 60-mile range hybrid has
23 more batteries, therefore, its incremental cost is
24 a bit higher, but it is primarily due to the
25 battery costs.

1 One thing that is interesting here is
2 that the zero-range hybrid battery is only
3 slightly less than the cost of the battery to give
4 you a 20-mile range. The reason for that is the
5 chemistry difference. The zero-range hybrid is
6 much more expensive battery. So, another message
7 in this slide is you can have a plug-in hybrid
8 without impacting the cost of existing hybrids.
9 Existing hybrids are already hot sale items.
10 Adding a plug to it will make it even more
11 attractive.

12 We heard a little bit about the use of
13 electricity. You know what happens let's say to
14 the electric grid if we plug in all these cars at
15 night. This is what happens if 20 percent of the
16 population of cars in the City of Sacramento were
17 to be plugged in at night.

18 The blue part is the base load or the
19 night time load. Over on the right hand side if
20 20 percent of vehicles in the City of Sacramento
21 were to be plugged in, that blue part comes up to
22 the just the medium part of the curve. In other
23 words, you don't fill in the entire curve with 20
24 percent.

25 What is 20 percent of the vehicle fleet

1 penetration. How long is that going to take? It
2 is not going to happen over night. At best, you
3 could sell these plug-in hybrids at maybe one or
4 two percent per year, 20 percent is going to take
5 ten years. We are looking ten years into the
6 future before we get to this slide on the right.

7 What is most important to realize is we
8 don't need any new power plants to do this. So,
9 obviously if 100 percent of the cars become plug-
10 in hybrids, you would want to build power plants.
11 Ten to twenty years into the future, we've got
12 plenty of energy available.

13 The result of 20 percent penetration of
14 plug-in hybrids over the next 10 to 20 years, no
15 more power generation is needed in California. No
16 change in electrical infrastructure is needed.
17 Less peak power needs to be generated, especially
18 if we implement other concepts that are possible.
19 We call this V2G or vehicle back into the grid.
20 What this really does is it makes the electrical
21 system, the electric generation system, more
22 efficient.

23 Because it makes the overall electrical
24 system more efficient, it would result in actually
25 lower cost electricity to everyone.

1 I think this next statement is what I
2 have already said. At a new car penetration of 2
3 percent a year of 60-mile plug-in hybrids, 20
4 percent penetration would take at least 10 years
5 into the future.

6 If they were manufactured today, so the
7 most important thing is there is no new technology
8 or manufacturing infrastructure needed to start
9 the plug-in hybrid today. All the technology is
10 now here.

11 We conclude that the plug-in hybrid is
12 probably one of the best ways to solve the
13 upcoming petroleum crisis and CO2 emissions today
14 at a very small incremental cost from today's cars
15 and trucks. We are not talking any changes in
16 infrastructure. We are talking very little. Of
17 course, there is an incremental cost, and I think
18 the experience with Toyota is the public is
19 willing to bear that incremental cost, otherwise
20 there wouldn't be a six month wait for a Toyota
21 Prius.

22 Renewable electric energy such as solar
23 and wind are perfect for plug-in hybrids and much
24 more efficient than other concepts now being
25 explored.

1 Gasoline use and plug-in hybrids can be
2 entirely replaced by incidentally, our friends
3 with the ethanol, with no impact on current volume
4 ethanol production. Why is that? That is because
5 currently reformulated gasoline is more or less on
6 the order of 10 percent ethanol.

7 These plug-in hybrids, especially a 60-
8 mile range one, only use 10 percent of the liquid
9 fuel of a conventional vehicle. Then you may as
10 well run it on ethanol and run it on no gasoline
11 at all. That doesn't effect the ethanol
12 infrastructure that is already here.

13 What do we need to get this thing
14 started? What we need is our regulations or
15 something to encourage and reward OEM's and the
16 public for being the first adopters.

17 Some possible no-cost incentives, and
18 this is of course for the State of California who
19 is already in financial trouble. It better be a
20 no-cost incentive, otherwise it is not going to
21 work in California.

22 How do we do this? Well, here are some
23 of the concepts. Provide credits proportional to
24 zev range above 20 miles before the engine has to
25 sustain the battery, that is one way, credits. I

1 am talking about tax credits. Provide tax credits
2 for plug-in hybrids manufactured in the USA.

3 There is a lot of talk that foreign companies are
4 going to spring another surprise technology to the
5 US, and we should try to beat them before they get
6 here.

7 Driving perks, such as use of HOV lanes.
8 I think that is working in Southern California
9 now. It should be encouraged for these plug-in
10 hybrids as well.

11 Parking perks. I think people mentioned
12 parking perks, for example, I am going to pay
13 about ten bucks to park here today. If I had a
14 plug-in hybrid and I could save ten dollars a day,
15 it wouldn't take very long to pay back the
16 incremental cost.

17 Tax credits for ethanol and the
18 submission of receipts. I think one of the
19 problems is our ethanol program in the past, we
20 had all those FFV's that Commissioner Boyd
21 mentions that used on gasoline. Two-fold, there
22 is no real incentive to use ethanol versus
23 gasoline.

24 The second thing is there aren't enough
25 ethanol stations. Maybe if you added a tax

1 credits for submission of ethanol receipts, that
2 may be one way to do it.

3 The objective here is to provide payback
4 for incremental costs of less than about two
5 years. If we do that, then I think we can
6 incentivize. I think one of the main goals here
7 of this workshop is how do we get this stuff
8 started.

9 If we keep this objective of being able
10 to pay back incremental costs of this technology
11 in less than two years, this may be the thing that
12 can drive the technology forward.

13 That is my presentation. I will be
14 happy to answer any questions and of course offer
15 my services to the Commission.

16 PRESIDING MEMBER GEESMAN: Thank you
17 Professor Frank. You are speaking to three of us
18 that drive the zero-range hybrid. My question is,
19 how much larger a battery or battery bank would we
20 need to get to either a 20-mile range or a 60-mile
21 range?

22 MR. FRANK: You would be surprised how
23 little the increment is to get to a 20-mile range.
24 To get to a 60-mile range would take you more.
25 However, when you design the whole car, and by the

1 way, we have designed these 60-mile range cars,
2 and when designed the entire car, we down-sized
3 the engine and transmission as we go to larger
4 battery packs. The net weight and volume of the
5 power train is about the same.

6 If you only replace let's say a Toyota
7 Prius battery with a bigger battery but you don't
8 down-size the engine, of course it is going to
9 take up a little more space. There is a kind of
10 grass roots group called CalCars -- it has nothing
11 to do with a simulation program, but it is run by
12 Felix Kramer and is kind of a gas roots group that
13 are converted Toyota Prius' to plug-in hybrids.
14 They are taking maybe if you look in the trunk,
15 you know, you have a spare tire and above that
16 spare tire, they are taking about six to eight
17 inches of floor space up out of the trunk in order
18 to make it a 20-mile range hybrid.

19 They are working on that now, and they
20 are having some successes. It can be done. That
21 is the point.

22 PRESIDING MEMBER GEESMAN: Thank you.

23 COMMISSIONER PFANNENSTIEL: Professor

24 Frank?

25 MR. FRANK: Yes.

1 COMMISSIONER PFANNENSTIEL: When you
2 were talking about the effect on the electric
3 infrastructure such that your view is that there
4 would be really no impact or it would be a
5 positive impact I guess because it would be an
6 increase in the baseload usage. Were you assuming
7 there two things? First of all, of course, that
8 these would always be plugged in at night? In
9 other words, nobody would drive to work and plug-
10 in near their office during the day. Second, that
11 the existing peaking capacity would be able to
12 extend their hours such that they would be
13 available for baseload production also?

14 MR. FRANK: Yes. There are a number of
15 questions there. Sure, what I have assumed here
16 is that these cars would be charged at night. The
17 purpose of designing this kind of car so that they
18 can be charged at night is part of the technology
19 design that we put into this vehicle. Night time
20 charging using standard GFI plugs in everybody's
21 garage is the whole idea. This means that these
22 things don't charge at a very high rate. At 110
23 volts in 1 1/2 kilowatts maximum. We assume in
24 all our calculations that the cars are charged
25 overnight and essentially full charged.

1 The key is if you don't fully charge.

2 Suppose you get home late at night and it is
3 midnight and you only charge for only three hours
4 or four hours, it is not a problem. You can still
5 drive the car, it drives like a regular car. You
6 don't have to charge. If you don't charge, there
7 is no penalty for it, you just use more gasoline
8 that day.

9 Your second question I think was about
10 base load production. Yeah, if ten years from now
11 if we get to 20 percent penetration for plug-in
12 hybrids, we should be converting some of our
13 peaking plants to base load plants. I think
14 that's nothing but good because base load is much
15 lower cost than peaking loads.

16 COMMISSIONER PFANNENSTIEL: The
17 assumption isn't that the current plants are
18 available, but as we add plants, we will be adding
19 more base load rather than peaking plants?

20 MR. FRANK: That's right, that is
21 exactly the point I am trying to make here. Thank
22 you for clarifying that actually.

23 PRESIDING MEMBER GEESMAN: Probably a
24 better usage pattern of the new combined cycles
25 than they have experienced to date.

1 MR. FRANK: Yes, that would be the
2 ideal. Don't forget the renewables, wind and so
3 on would be ideal for this application.

4 COMMISSIONER BOYD: Thank you, Andy.

5 MR. FRANK: Thank you.

6 PRESIDING MEMBER GEESMAN: The next
7 speaker is Shannon Baxter.

8 MR. FONG: I am sorry. Shannon indicated
9 this morning as well that she was going to be
10 delayed. So, you have the option of picking up
11 Randall von Wedel who was earlier on our --

12 PRESIDING MEMBER GEESMAN: Why don't we
13 do that.

14 MR. FONG: Okay.

15 MR. VON WEDEL: Good morning, I am going
16 to go ahead and start my presentation on a verbal
17 basis. We have a power point obviously, but we
18 are waiting for a technical interface to happen
19 here.

20 My name is Randall von Wedel. I work
21 with several different bio-diesel programs and
22 community programs here in California. I also do
23 a fair amount of interfacing with the National
24 Bio-diesel Board in the Mid-west.

25 I have been working on bio-diesel for

1 about eleven years, have the privilege of having
2 started some of the first fleets and programs here
3 in the Bay Area as far back as 1993.

4 This is my first opportunity to speak to
5 the Energy Commission, and I am grateful for the
6 opportunity.

7 I would much prefer to have my slides,
8 but I will use them as a guide on my own here.
9 The material I will pass on to you as a -- I guess
10 I will send that off to you as a complete program.

11 I was asked by the way Sunday,
12 yesterday, to speak. The normal speaker was
13 unable to make it from St. Louis for a good
14 reason. Our speaker would have been here today,
15 Scott Hughes, had an appointment with the IRS.
16 Normally that is not a happy opportunity, but
17 thanks to federal excise tax incentives, he has
18 been put on the committee to establish the
19 legislative language to implement as of January,
20 just in three weeks, new federal tax incentives to
21 promote the use of bio-diesel in the United
22 States.

23 In effect, that is basically a good
24 launching point for my presentation today. Just
25 to speak informally, 49 out of 50 states in the

1 United States are actively promoting some type of
2 bio-diesel programs. In some cases, as in the
3 situation in Minnesota, legislation was recently
4 passed to mandate 2 percent of all diesel fuel to
5 be now bio-diesel. Of course in Europe, it is up
6 to 5 percent in some of the countries.

7 I will just get going here with this
8 little program, and we will go from there. I am
9 going to have to do it, I don't think it is coming
10 through. So, I will use this as my own guide.

11 My purpose in speaking this morning is
12 to try to provide some background and
13 recommendations on how bio-diesel perhaps could be
14 better integrated into the 2005/2006 Integrated
15 Energy Report. I am going to give you a brief
16 overview of where bio-diesel is today in
17 California. Many of you are familiar with the
18 fuel. I know Commissioner Boyd has reviewed it in
19 the past.

20 The first comment I want to make is bio-
21 diesel is intended to be a transition fuel.

22 Personally, I got into the industry because of my
23 interest in medical aspects of it, the benefits of
24 it for public health, and the fact that we could
25 make changes in environmental conditions within

1 our communities today rather than waiting years
2 for some of the wonderful technology that you have
3 heard about this morning.

4 Bio-diesel is already actively being
5 used in California, primarily on a test basis or
6 in the case of many federal fleets. We are only
7 selling right now I would say about four million
8 gallons of bio-diesel a year, but that is twice
9 over what it was the year before, and it will be
10 doubling again this coming year. Again, partly
11 because of federal subsidies as well as tax
12 incentives.

13 From my perspective, one of the most
14 advantageous points of bio-diesel of course is a
15 reduction in particulate material. Not so much
16 the quantitative aspects, bio-diesel in blends or
17 in its neat form, can produce up to a 60 to 70
18 percent reduction PM, but the PM reduction is also
19 qualitative in that the mutagenic and carcinogenic
20 properties of the soot are changed dramatically.

21 The Tier 1 health testing for bio-diesel
22 exhaust was first done here in California at the
23 University of California Davis just a few minutes
24 away. That was using the original Ames test and
25 other mutagenicity test. In 2001, bio-diesel

1 passed and completed the so called Tier 2, EPA
2 Tier 2 health effects study, and to my knowledge,
3 it is the only liquid fuel that has gone through
4 that entire analysis.

5 The result of the study, which was based
6 on albino, these white rats, was that the adult
7 rats suffered no obvious damage. There was no
8 change -- there is no mortality of course, there
9 was no change in behavior. They ended up doing
10 all of this pathology to show that in a few cases
11 there were slightly enlarged lungs and a few minor
12 pathological observations in organs.

13 The protocol for the EPA called for
14 analyzing the dead rats, and of course at the end
15 of the study, these animals had been exposed to
16 various higher and higher concentrations of bio-
17 diesel exhaust. None of them died, so they had to
18 call and get permission to alter the protocol just
19 to sacrifice them.

20 In addition to reducing PM, there are
21 dramatic reductions in carbon monoxide. Fairly
22 good reductions in hydro-carbon, and of course,
23 being a sulphur-free fuel, there are really good
24 reductions in sulphur, particular as you go to
25 higher blends.

1 We like to think of the bio-diesel as an
2 easy fuel retrofit as opposed to a mechanical
3 after treatment. We would like to think that bio-
4 diesel would be completely compatible, but that is
5 one of the reasons we have had problems developing
6 the fuel much further in California, and one of
7 the reasons why I am here today is try to find
8 ways in which the Energy Commission can help us
9 review and evaluate some of the data that has been
10 published, some of it very recently, and see how
11 that data can be assessed from a third party
12 perspective and then help us present it back to
13 other agencies such as CARB.

14 One other aspect about bio-diesel and
15 similar to some of the other programs you have
16 heard of this morning, is we get a very immediate
17 reduction of petroleum, liquid petroleum fuel, and
18 that in turn leads to a component of energy
19 security which we think is a very important one
20 nationwide.

21 Bio-diesel has its own ASTM standard as a
22 blending stock which gives it a big advantage. As
23 I mentioned at the beginning of my informal
24 presentation, bio-diesel is a federally recognized
25 EPACT fuel, even the 20 percent blend is

1 considered a fuel that will give federal fleets
2 credits, and they are already being used to a
3 great extent by federal fleets and military fleets
4 in California. So, it is up and running, we just
5 need to figure out how to integrate that kind of
6 policy with what CARB and the State of California
7 would like to see happen.

8 I just want to mention for those of you
9 that aren't familiar, bio-diesel is made from a
10 variety of different vegetable oil or animal
11 tallow feed stocks. In California, we are still
12 importing soy bean. It is crazy, but we have to
13 do that now first because of demand. It is going
14 so fast, we are not building plants fast enough
15 yet.

16 Second, there are still farm bill type
17 of subsidies here in the United States that
18 promote the use of the virgin, that is the first
19 use oils. Those first use oils subsidies are
20 going to continue, although we think they are
21 going to be diminishing. We are going to be
22 phasing out the use of soy bean that I get
23 frustrated has to be hauled all the way from the
24 Mid-west and start favoring the use of recycled
25 cooking oils. In the short term, we are hoping to

1 be starting to develop agricultural feed stocks
2 here, which I will get into in just a minute.

3 The point is, there is a wide range of
4 feed stocks. For the skeptics in the audience,
5 and I was certainly one of them, we have data
6 which I will be presenting to the CEC in a written
7 form showing that with current production
8 technologies and current available land and the
9 way the agricultural economy is set up in the
10 United States today, and with the use of yellow
11 oil, yellow grease, which is basically recycled
12 cooking oil, we already displace something like 5
13 or 6 percent of all the diesel fuel in the United
14 States.

15 If we then went to do more aggressive
16 tendencies or technologies such as utilizing white
17 grease and brown grease, not a very pleasant
18 topic, but not very difficult to do chemically, or
19 we started developing industrial crops, which is
20 what they do in Europe now, we could easily push
21 the net displacement of petroleum over 10 percent.
22 That is based on studies done by Enrel.

23 Which leads me to my next point. We are
24 hoping that the CEC will serve us again as a role
25 as an information portal to try to help us to

1 present technology as well as some of these most
2 recent studies by Enrel by the National Renewable
3 Energy Lab into CARB.

4 We find that there seems to be a bit of
5 a not conflict, but we seem to find a disconnect
6 between the federal studies at Enrel and what are
7 being considered the ideal models here in
8 California.

9 I mentioned the emission reductions.
10 I'll just give you a couple since you don't have a
11 slide, and I apologize, but the B-100 which is 100
12 percent, just to give you some examples, would
13 give a 43 percent reduction in carbon monoxide, a
14 56 percent reduction in hydro carbons, and these
15 are all relative to carb diesel. A 55 percent
16 reduction in particulate that I mentioned,
17 although keep in mind there is a qualitative
18 aspect as well in terms of lower air toxicity and
19 carcogenicity.

20 When it comes to the greenhouse gasses,
21 by life cycle analysis of carbon, and again this
22 was published by Enrel in 1998, the bio-diesel in
23 its pure form would represent a 78 percent
24 reduction in greenhouse gasses relative to using
25 carb diesel today.

1 Now we don't expect and we don't
2 particularly recommend that we use B-100 in the
3 pure form, I'm just giving you those numbers as
4 extremes.

5 The National Bio-diesel Board and the
6 National Fleets of Bio-diesel around the United
7 State are generally B-20, meaning a 20 percent
8 blend of bio-diesel with whatever diesel fuel is
9 used in that state, obviously not carb diesel.

10 We are now in the process of doing
11 studies with ultra low sulphur diesel blended with
12 our bio-diesel made here in California, not the
13 soy bean bio-diesel, but rather feed stocks from
14 California that would either be the recycled
15 yellow grease I mentioned. It could be palm oil
16 which is imported in huge quantities in California
17 right now. Or thirdly, new agricultural oils such
18 as the mustard, which I will get to in a minute.

19 If we were to use some of those existing
20 California feed stock bio-diesels, combine them in
21 a ratio say 25 or 30 percent with say 65 or 70
22 percent ultra low sulphur diesel, we are fairly
23 confident that particular blend would achieve the
24 level one reduction in particulate material that
25 is now going to be required by CARB as of 2006.

1 That means dropping PM by 25 percent without a
2 significant increase in NOX. That is again one of
3 the specific strategies or goals we would like to
4 present to the Energy Commission and have them
5 look at the data with us at it is generated.

6 There are two places doing that research
7 right now. One of them is the South West Research
8 Institute that is on going right now. The other
9 is right here at UC Berkeley at the Combustion
10 Analysis Laboratory.

11 The regulatory status of bio-diesel is a
12 bit in question. Starting with the Department of
13 Food and Agriculture who have the oversight on
14 liquid fuels. The division of measurement
15 standards does allow the B-20, the 20 percent
16 blend to be recognized since it falls into the
17 criteria of ASTM D975, which is the original
18 definition of diesel fuel here in California.

19 Higher blends do not necessarily meet
20 ASTM D975, and therefore, they currently require a
21 variance request, which has been done. We have
22 cities, counties, fleets, military, all kinds of
23 groups now complying with the DMS request to
24 provide a variance letter so that they can
25 continue using these fuels in different blends as

1 what we are now calling a developmental fuel.

2 There is no standard yet for ASTM as a
3 B-100, that is as neat fuel. Our current ASTM is
4 only for blends, and that is another issue we
5 would like to address in the future.

6 As I mentioned, these regulatory
7 impacts, let me remind you we are dealing with a
8 liquid fuel that has virtually the same properties
9 as diesel in terms of performance, and yet, is
10 non-volatile, non-flammable, and non-toxic. There
11 alone, we have huge advantages. From a regulatory
12 perspective, those advantages rarely get
13 recognized. In fact, even in local townships, we
14 still have to do double containment. We follow
15 all the protocols as if we were handling a regular
16 diesel fuel.

17 CARB still considers bio-diesel to be
18 diesel put in a nutshell. So, today, we have the
19 same kind of resistance. We have their same
20 concerns. They naturally are concerned about NOX
21 increases, but fortunately, local research as well
22 as research done by the National Bio-diesel Board
23 just in the last six months suggests with new data
24 that using blends that do not use soy bean, but
25 rather use other feed stocks, as I mentioned, in

1 combination with the ultra low sulphur diesel from
2 California and using additives such as anti-
3 oxidants, that combination appears to generate
4 blends of bio-diesel that are NOX neutral relative
5 to diesel fuel.

6 We are hoping that new data that perhaps
7 could be introduce in concert with the Energy
8 Commission would help to alleviate some of those
9 concerns that CARB has.

10 I want to take this opportunity to wrap
11 up by going into some examples of the types of
12 things that we think the Energy Commission might
13 be interested in doing.

14 I mentioned before the opportunity to
15 perhaps liaison with CARB and perhaps even with
16 DMS. We would really hope the Energy Commission
17 would have an opportunity to provide technical
18 review in critique of published research data. I
19 emphasize in particular the Tier 2 health effect
20 studies which seem not to be very well recognized
21 here in California.

22 There are many kinds of studies we would
23 love to see here in California that are specific
24 to our state that might be of interest to the
25 Energy Commission. One would be to determine that

1 blend that mentioned, what would be an optimal
2 blend of bio-diesel and ultra low sulphur diesel
3 that would achieve CARB Level one compliance
4 without significantly increasing NOX.

5 Another is to see how well bio-diesel
6 would interface with the proposed after treatments
7 for NOX reduction such as the clear air/lung view
8 technology which we are very interested in.

9 I have met with Brad and we have talked
10 it over, and we just need to find a way to get
11 some type of government support or perhaps call
12 sharing programs in place to test the bio-diesel
13 and its compatibility with a variety of after
14 treatments.

15 I mentioned UC Berkeley. I am also
16 doing a project now with Cal Poly State
17 University, and there is a lot of interest in
18 trying to establish different combinations of
19 additives and bio-diesel blends to see again what
20 we can do again to reduce the NOX and make it as
21 compatible with the goals of CARB as possible.

22 Those are areas that we would love to
23 interface with the Energy Commission. There is
24 always opportunity of course for demonstrations.

25 I am acting as a volunteer consultant to the San

1 Francisco Muni. They already have fuel, they are
2 interested in testing bio-diesel in one of my
3 favorite projects which is to run it in the old
4 busses.

5 I am always a little embarrassed as a
6 San Franciscan myself to tell you that we still
7 have 100 two-stroke engines running around the
8 streets of San Francisco. They are going to be
9 phased out, but gee, how did I live in the City
10 that still has these old two-strokes. Those would
11 be an obvious place we could again transition in
12 the bio-diesel and try to minimize immediately the
13 impact that they have as they bring in diesel
14 electric hybrids.

15 There again, we don't have much data for
16 bio-diesel in diesel electric hybrids, so that
17 would be another topic of interest. Muni has
18 already agreed to work on that.

19 The Port of Oakland, we had a lot of
20 discussion this morning about the Port of Long
21 Beach. The Port of Oakland is an area we are very
22 concerned about because of the particulate
23 emissions that end up down wind in West Oakland.
24 We read recently that the Energy Commission is
25 helping to sponsor a study on the Lubrisol or

1 diesel water emulsion. We are hoping there may be
2 an opportunity also to test bio-diesel blends as a
3 centrally fuel location where local truckers can
4 come up and fuel up on a cleaner fuel to
5 immediately reduce stack emissions.

6 One of my frustrations living in the Bay
7 Area is noticing that most of the trucks that haul
8 those containers around, they are not the modern
9 brand new trucks, they are all these independent
10 truckers. I have talked to them. I happen to
11 speak Spanish. I spent a lot of time talking to
12 drivers and interview them informally, and my
13 impression is that a lot of those trucks are only
14 worth \$5,000 or \$6,000, and they are not going to
15 be able to retrofit them with expensive equipment.
16 We could, temporarily at least, provide those
17 older trucks with a fuel retrofit and immediately
18 have an impact on the health and benefits of the
19 community and the children of West Oakland.

20 Ending up my favorite favorite topic, I
21 just drove down this morning from the mountains
22 where I spent time with my nephews. They get on
23 school busses every morning that have standard
24 diesel engines. They are older busses again.
25 Even there is a big interest in using CNG or using

1 fairly complex retrofit technology for mechanical
2 after treatment, frankly those rural communities,
3 I just don't see them rapidly change course of
4 action right now. Meanwhile, those children are
5 still getting on old diesel busses where the
6 studies have been done that just keeping a window
7 open a little at the top generates enough suction
8 that the ambient conditions of the air inside a
9 school bus are dramatically worse than they are
10 outside the school bus even when it is idling.

11 There again, it would be an easy shoe-in
12 to put bio-diesel in these areas where centrally-
13 fueled fleets are really difficult. One of our
14 first studies way back in 1994 was ironically with
15 PG & E because they have line trucks from the
16 border of Mexico all the way to Susanville, and
17 there is no way they could actually fuel those
18 individually with CNG, so they were actually one
19 of our first test programs in bio-diesel. I think
20 that same concept could be applied to all types of
21 rural and off-road applications from lumber trucks
22 to snow plows, from rural school busses all the
23 way to street sweepers in Berkeley. There ought
24 to be many opportunities where in addition to, not
25 instead of, all these other technologies we

1 discussed today that bio-diesel could serve as a
2 transition fuel.

3 Sorry for the informality. The
4 Commissioners will get the actual program, and I
5 will be available at any time to answer questions.
6 Thank you.

7 PRESIDING MEMBER GEESMAN: Thank you,
8 Mr. von Wedel. I look forward to your written
9 materials. I do think we can provide a forum to
10 bring in both the Air Resources Board and publish
11 research that has been done in this field. I
12 think that is one of the more valuable functions
13 that we can probably perform in this 2005 cycle.
14 I thank you for your comments and bringing to our
15 attention the information in your presentation.

16 MR. VON WEDEL: Thank you very much.

17 MR. FONG: Do we get a lunch break?

18 PRESIDING MEMBER GEESMAN: I was just
19 going to ask you, Dan. This might be an opportune
20 time to take one.

21 MR. FONG: That is a grand idea.

22 PRESIDING MEMBER GEESMAN: Why don't we
23 come back at 1:15.

24 (Whereupon, at 12:17 p.m., the workshop
25 was adjourned, to reconvene at 1:15

p.m., this same day.)

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1 AFTERNOON SESSION

2 1:20 p.m.

3 MR. FONG: I would also like to remind
4 anybody who is on line on a conference call option
5 to try to mute your phone if you have that option.
6 We tend to pick all sorts of background noise,
7 people shuffling papers, making other calls, etc.
8 It can be very distracting here in our hearing
9 room. So, I would ask for your cooperation in
10 helping us mute that background noise.

11 PRESIDING MEMBER GEESMAN: Thank you. I
12 want to start with Edward Burton.

13 MR. BURTON: I don't have any of the
14 modern goodies. The story that I have to tell
15 goes back quite a ways, and it actually combines
16 two major problems that we face here in
17 California. The one that more suits my background
18 is the threat of forest fires which burned 70
19 million acres last year in the US. When you
20 consider that most forest lands when a forest fire
21 burns, somewhere between 50,000 and 100,000 pounds
22 wood burns and of course that produces carbon
23 monoxide and carbon dioxide and all the other
24 harmful things that cause global warming.

25 The work that I have done over the past

1 20 odd years since I sold the Microfork Company
2 has centered around energy from wood. By way of
3 allocation, I had an unsuccessful effort to make
4 burn wood in a clean smoke burner and produce
5 steam and sell power.

6 That convinced me that what we needed to
7 do was to go back to what I knew in World War II
8 where there was no civilian gasoline for the
9 ordinary person's use. The war effort that is in
10 Europe and Asia, Germany, Norway, Japan, China,
11 all of those had no gasoline, so that should be
12 kept in mind as I listened this morning to so much
13 reduction or some much improvement.

14 You are actually looking at the very
15 real possibility of we depend for 65 percent of
16 our oil on foreign sources, and I have forgotten
17 what percentage of that is in unstable
18 governments. Why we are going to face some very
19 real more than a shortage, just plain nothing.

20 Incidentally, I was going to Davis in
21 1942 when there were only 1,100 students and they
22 shut down the student part of the University and
23 became a Signal Corp training base.

24 We are facing, I think, the same
25 situation that we faced after Pearl Harbor. It

1 hasn't really happened, but that brings me then to
2 the first of all the waste water which is 7
3 percent of the electricity in most cities. We are
4 using redwood bark fiber which is the basis of my
5 process, able to treat waste water completely with
6 solar using the oxygen that the algae put in the
7 water as the basis for the work.

8 The think I want to talk about now
9 however is the gasification of wood. Now it is
10 not as complicated as you might imagine. If you
11 talk to anyone that had to use gas fires in World
12 War II they will tell you it is a very poor
13 system, and it was. It gummed up the engines. It
14 produced high levels of carbon monoxide. The
15 filtering of the gas was a big problem.

16 As we look at the gasification of wood,
17 we have to look at the high energy costs to gather
18 the wood and dry it. To gasify wood you have to
19 be under 10 percent moisture.

20 If you dry wood infinitely in the air
21 here, you are going to -- the so called dry wood
22 is around 15 or 20 percent moisture, so that is a
23 requirement. The small wood that we are talking
24 about, the wood under nine inches in diameter is
25 the major factor in forest fires.

1 Big trees over a foot or so in diameter
2 don't burn. It kills them, but it doesn't burn
3 them ordinarily, a live tree. In looking at this
4 small diameter wood, it has to be cut and removed,
5 and the current method is various brush hogs,
6 chippers, and feller bunchers and so on that use
7 more power than you can get from the wood even if
8 you gasify it.

9 Chipped wood, the chips that the chipper
10 produces is very difficult to dry except in a
11 rotary dryer, which again uses more energy than
12 you get out of the gasification.

13 So, beginning about 20 years ago when it
14 became evident that I couldn't make power by
15 simply burning green wood, I've been studying
16 gasification and its requirements and what you
17 need to do.

18 The old handsawing that I started out
19 with is too labor intensive and is not likely to
20 come back. This then leaves us with the gas chain
21 saw or the electric chain saw. That is where a
22 great improvement has been made. Makita and
23 several others make a battery powered small chain
24 saw that cuts up to five inches in diameter, which
25 is a very efficient little piece of equipment. We

1 have used that plus some others.

2 The larger chain saw that go up to 15
3 inch in diameter are reasonably good quality. Of
4 course, it needs a 110-power system. Now we can
5 do that with a battery and an invertor, and that
6 is what we have done.

7 In the rocky steep country, there is no
8 riding vehicle that is really safe. So, we have
9 developed an electric wheel barrel with wide
10 wheels. When it gets on the market, it will cost
11 between \$1,500 and \$2,000, and it carries enough
12 battery power to outlast most workers.

13 I have used it now for a number of
14 years, and it is really a pleasure, particularly
15 those of us who had to work with a gas chain saw,
16 which I have been using since 1940, and they are a
17 terrible piece of equipment.

18 That is the way we can do it. The
19 problem then is the cost of wood's labor which the
20 workman's comp rate for wood's workers is over 50
21 percent, and contrary to what people think, it
22 takes a great deal of skill to be a successful
23 woodworker.

24 Logging is a great game, but it is very
25 dangerous, very hard to do, and it involves such

1 things as hang ups, spring backs, and that sort of
2 thing.

3 What we have then is the requirement for
4 the equipment. If you are going to work on
5 material under nine inches, it is within the
6 capacity of most people. By using this solar
7 powered, that is solar charged equipment, the
8 ordinary home owner can cut this small wood and
9 dry it.

10 To dry it, the solar dryer that Phil
11 Jergenson, my associate, has developed is
12 basically a four foot by eight foot by one foot
13 deep covered with a plastic, and it is exposed to
14 the sun, and we get temperatures there of close to
15 160 degrees. It uses no power, it dries about
16 1,000 pounds of wood. It does take three to four
17 weeks to dry, but this is the best we are doing
18 now.

19 We expect if we get the gasifier
20 operating that we can use the excess heat from
21 that to accelerate the drying so that the
22 opportunity then centers then on the gas fire.

23 In my handout I gave you is a drawing
24 from a book called "Heat Engines" published in
25 1910. Before gasoline became cheap and available

1 in and around the 1900 era, wood gasification
2 again was the source of a great deal of power.

3 Downdraft gas fire which is the one
4 Renewable Energy Development Institute has and we
5 use and operate occasionally just to get data and
6 show. The downdraft gasifier is the easiest one
7 to build and operate, and it is essentially if you
8 can just imagine a pipe. You start the fire in
9 the bottom, and then you add wood, and then the
10 wood descends this pipe, and it is a heavy steel
11 pipe. As you heat wood, methane comes off, but
12 that methane in the downdraft gasifier then burns
13 because there is oxygen. There is air coming down
14 the pipe at the same time.

15 As you get to the bottom of the pipe,
16 there is no more oxygen. It is an oxygen star
17 thing, and as you know, the general formula for
18 wood is C12, H22, O11. So, in the gasification
19 zone, the carbon unites with the oxygen that is
20 actually in the wood itself. That goes off as
21 carbon monoxide, and carbon monoxide burns. That
22 is in the range of 20 percent carbon monoxide.

23 In the downdraft gasifier, the remaining
24 hydrogen goes off as hydrogen, and it can be
25 anywhere from 9 to 22 percent of the gas that goes

1 off. The balance is what is left of the nitrogen.

2 The closetop gasifier, and it has
3 several other names, is a batch process where the
4 oxygen is completely cut off, and it proceeds on
5 just the gasification process. It is somewhat
6 more complicated. I won't go into that.

7 The net result then is that closetop
8 gasifier produces 45 percent hydrogen, which is of
9 course easily separated from the other gases
10 because it is so much lighter. That is the main
11 thrust of our research at the moment. That
12 hopefully will be the standard system.

13 We have modern ceramics that weren't
14 available to those earlier workers, and more
15 particularly the high temperature ceramics. The
16 higher temperature and the more efficient the
17 gasification particularly in terms of the
18 residual.

19 If we can heat up the ceramics hot
20 enough so that it sustains the gasification
21 process, why then we have a pretty good chance of
22 making the closetop gasifier work very
23 efficiently.

24 In the gas that comes off or any pre-
25 moisture of course turns to steam, and if you put

1 steam in wood, you get an extractive, and that
2 extractive makes a very hard varnish that will
3 stop your engine or whatever you have. That calls
4 then for a filter.

5 In my work with filtering gasses, I hit
6 on the idea of using horse manure for filtering
7 gas, and it works very well. After all the
8 smiles, I see a few smiles. It is a cellulose
9 fiber which means that it exerts the colloidal
10 attraction for a colloid which is of course what
11 smoke and aerosols are. The vanderwal forces is
12 what we are talking about.

13 That is the combination. The gas fire
14 going through the bionox produces a rather clean
15 gas, and happily the organics in the horse manure
16 somehow reduce the NOX by a process I can't
17 explain. We get 70 or 80 percent reduction of NOX
18 in what we call the bionox.

19 Those are high tech/low tech answers
20 that are available right now. If any of you want
21 to come over to Willits, I'll give you a tour, and
22 we will even start up the gas fire. If we relate
23 this back to my experience in World War II, some
24 of the talks that you have heard this morning
25 center around improvements and extension of

1 mileage and that sort of thing which is fine.

2 If you look at replacing 65 percent of
3 the gas that we have, you are looking at some
4 radical things which leads me to the next point.
5 That is our rail village concept.

6 The little town of Willits is where the
7 railroad from Ft. Bragg meets the main railroad
8 going from San Rafael to Eureka. So, we have
9 three railroad tracks leading into town that are
10 unused at the moment and represent what we feel is
11 the answer for not only Willits but any town where
12 there has been a railroad right-of-way. So, going
13 out on the railroad and setting up these little
14 villages which would be powered by wood gasifiers
15 which would power a sawmill using the new Lucas
16 Mill developed in Australia, that would then be
17 since it wouldn't operate at night, it would be
18 available to charge the electric vehicles.

19 In town there would only be electric
20 vehicles. In the woods, and I have been doing
21 this now for 25 years, would be only four foot
22 wide mini roads. The logging roads that we built
23 were really very hard on the land. In the '30's
24 when they changed from skid logging to caterpillar
25 tractors, they thought this was going to be

1 wonderful because then you could just go anywhere
2 and get the logs out.

3 Actually, it was a big step back because
4 while the old highly logging seemingly caused a
5 lot of destruction, it left the soil pretty much
6 in tact.

7 That is the presentation I have, and we
8 are continuing. I am privately funded since I
9 have sold the company and it is now part of
10 Westinghouse, I am able to do this work.
11 Hopefully we will be able to demonstrate and
12 market equipment that the homeowner or in
13 particular those that want to move out into places
14 like Marin County and Sonoma County and actually
15 in Southern California.

16 Someone, and I don't know if this is
17 true or not, but someone long ago said they grow
18 enough brush in the Los Angeles Basin to power it
19 completely. I don't know whether that is true or
20 not, but it very well could be. The brush in Los
21 Angeles, the brush fields are almost impossible to
22 control fire, and I can attest to that because I
23 was with the East Bay Forestry Department in the
24 late '40's when we did have an Oakland-type fire
25 although not so serious.

1 If there are any questions, I'd be glad
2 to answer them, but any of you that are interested
3 in this, I would urge you to think in terms of
4 what is going to happen because the Hubbard's Peak
5 has proven to be right so far. If he continues to
6 be right, somewhere between 2010 and 2030 we are
7 going to be in a situation pretty much like I've
8 described.

9 PRESIDING MEMBER GEESMAN: Thank you
10 very much, Mr. Burton. We appreciate your
11 comments here today. The next speaker is Shannon
12 Baxter.

13 MS. BAXTER: Good afternoon. I am
14 Shannon Baxter-Clemens with the California EPA.
15 We just had our new secretary named, formerly
16 Chairman Lloyd. I used to work for Chairman
17 Lloyd, now I work for Secretary Lloyd. He can't
18 stand to not be my boss, but it is a very positive
19 move from my point of view and from the hydrogen
20 highway, we were just thrilled that he was named
21 as the new secretary.

22 I do want to talk to you a little bit
23 about the Hydrogen Highway. I don't want to go on
24 about it longer than you think is useful. Feel
25 free to ask questions at any point. I am going to

1 go through some slides pretty quickly.

2 Obviously, hydrogen is not the near term
3 option we are pushing with the leadership through
4 the governor to make strides. As the governor
5 said when he opened the LAX Station in October, if
6 you want to be a doctor and start now, you may
7 become a doctor in ten years or an olympic athlete
8 or whatever you want to do, you have to start in
9 advance. That is the point of view that we take
10 is that we are starting now because we don't want
11 to get to a point where we don't have anymore
12 options in California. You understand this better
13 than anyone I am sure.

14 Just quickly I will talk about the
15 initiation of the project. The core values
16 driving the network, and I will skim over those
17 very quickly. The implementation of the executive
18 order that is known as the Hydrogen Highway Order,
19 and I will spend a little more time on the action
20 plan and some of the conclusions that have come
21 out of our Implementation Advisory Panel.

22 Project initiation. The governor talked
23 about the Hydrogen Highway in the State of the
24 State. We have reason to believe that he will
25 mention it again in the 2005 State of the State.

1 There is a need for policy development.
2 There is a need for research development and
3 demonstration, but as this national academy study
4 pointed out, there is a true need for leadership
5 as well as the research and demonstration.

6 The Executive Order was signed on April
7 20, and it direct CAL EPA to lead the development
8 of a California hydrogen economy blueprint plan.
9 We are in the final stages of revising that plan,
10 and we will have it to the governor at the
11 beginning of January.

12 The core values. I don't think I need
13 to go over this with this group.

14 Just looking quickly at some of the
15 fueling stations. Up on the top left is the
16 California Fuel Cell Partnership fueling station
17 that was put in in 2000 which we all thought was
18 just so sexy and pretty at the time, and now it
19 looks like a chemical plant.

20 Moving on to 2002, the station got
21 smaller, it produced hydrogen on-site, that is the
22 Richmond station. I don't want to steal Jamie
23 Levin's thunder. Up on the top right is a station
24 that is actually in Europe but very similar to the
25 station that was opened this year at LAX and it is

1 a retail design station. There is not really a
2 place you can buy your twinkles there, but it
3 looks like the type of station in the future.

4 Bottom right, 2005, this station is
5 scheduled to come on line next year. That is
6 where you and I and anybody else I believe can
7 drive up and buy hydrogen for their vehicles.

8 These are examples of vehicles. These
9 are all in and out of Sacramento at all kinds of
10 times.

11 The implementation, we have set up this
12 elaborate organization. We have had the input of
13 over 200 stakeholders in putting together this
14 blueprint. The executive order drove the
15 formation of the governor's executive order team,
16 which included Secretary Tamminon at the time, Ann
17 Baker, myself, and Daniel Emmett from Energy
18 Independence Now.

19 We developed a California Hydrogen
20 Highway Implementation Advisory Panel, and
21 Commissioner Boyd is a member, and Board member
22 Cynthia Verdugo-Peralta is a member. Oh hi, Ed,
23 Ed Kjaer from SCE is a member of our
24 Implementation Advisory Panel. It is a group of a
25 wide range of folks. I'll let you look at the

1 names very quickly. High level folks from
2 industry, well respected from the NGO's and high
3 level government officials.

4 The panel guided the work of the topic
5 teams, and the topic teams actually drove the
6 content that we drew from to make the blueprint
7 plan. We also have a senior review committee that
8 met last week, and that was made up of we had
9 Secretary Kawamura, Aguiar, McPeak. We had some
10 representative from Sen Torlakson's office. We
11 had the state fire marshall there, Chief Grijalva,
12 and they all bought off on the ideas that we were
13 putting forth.

14 The topic teams, there was a lot of
15 interaction. They all produced an independent
16 report that will be associated with the blueprint
17 plan. This is a list of my Implementation
18 Advisory Panel members.

19 These are some of the consensus
20 statements. We had five public panel meetings,
21 and at the very end of our last meeting, which was
22 about two weeks ago, there were a few statements
23 that were of consensus nature. The overall idea
24 is that we have an implementation, there is a
25 philosophy of how hydrogen is going to be

1 implemented in this state. It is going to happen
2 in phases. They didn't believe that any of the
3 analyses in the report were incorrect, there was
4 only one point, and it was actually how much the
5 vehicles cost in the out years, so we have taken
6 that out of the report as to how much actually
7 fuel cell vehicles cost.

8 They acknowledged on this first bullet
9 that California is leading the world in hydrogen
10 use in vehicles, stationary and other
11 applications, and this program will continue to
12 put California in a world-class leadership
13 position and position the state for successful
14 introduction of hydrogen technologies to meet
15 transportation, power generation, and other energy
16 demands in the future.

17 They believe that we will continue to
18 build our public/private partnership that has been
19 set up to date, and they advocated for that as
20 well.

21 This is an important statement that the
22 California Hydrogen Network is a broad initiative
23 for diversifying transportation energy use and for
24 providing environmental and economic benefits.

25 This program will make use of existing alternative

1 fuels and emerging technologies to help develop
2 hydrogen use and to bridge the gap between today's
3 alternative fuel technologies and hydrogen
4 technologies of the future.

5 We are not saying by any stretch of the
6 imagination drop what you are doing now. What we
7 are saying is that there are many pathways to
8 hydrogen. You just heard the last speaker talk
9 about wood gasification, the percentage of
10 hydrogen that comes off of wood gasification.

11 We believe that all of these are
12 pathways, and they should all be embraced in
13 moving forward to the ultimate future where we
14 have sustainable transportation and a reliable
15 energy sector in California.

16 The California Hydrogen Network will
17 investigate a variety of hydrogen production
18 options, but will also set renewable goals to move
19 towards energy sustainability. Not all hydrogen
20 is created equally. You will hear
21 environmentalists at times speak out strongly
22 against hydrogen, and what they are usually very
23 concerned about is the Bush Administration of
24 producing hydrogen from coal and from nuclear. In
25 this plan you will not see that those are viable

1 pathways in California. We advocate a percentage
2 of the hydrogen to come from renewables and these
3 are new renewables on top of the governor's stated
4 goal of 20 percent of a RPS in 2010.

5 Moving on, the California Hydrogen
6 Network should initially expand stations around
7 exiting hydrogen fueling stations. Stations
8 should be located in the greater LA region,
9 Sacramento, and San Francisco Bay Area stations
10 need to be sited near fleets or clusters of
11 vehicles in these areas. This gets into the
12 philosophy of actually bringing hydrogen stations
13 into California, how to reduce stranded
14 investment. Thinking about this in a smart way,
15 initially you saw a map that said we are going to
16 put a hydrogen station every 20 miles along the
17 interstate freeways and we have about 200 stations
18 and everybody can get to hydrogen.

19 That was a map that accomplished a very
20 important goal of getting the ball rolling,
21 getting people thinking about how many hydrogen
22 stations does it really take. It is not really
23 the sophisticated approach that we have agreed to
24 and that our panel has agreed to.

25 Government fleets should be encouraged

1 and incentivized to purchase hydrogen vehicles
2 based on technology and cost readiness.

3 Private fleets and then early adopters
4 should also be encouraged and incentivized to
5 purchase hydrogen vehicles as the technology
6 develops. This points to the importance of
7 biennial reviews. You will see a timeline in here
8 that looks at where do we think we will be when,
9 and this all contingent on biennial reviews
10 because we don't want the model of build it and
11 they will come. We are trying to learn from the
12 lessons of the past, and so we want their to be a
13 roll out of the vehicles and the infrastructure.

14 The California Hydrogen Network should
15 be a long term multi-phase approach with
16 developing hydrogen technologies. The first phase
17 will expand upon existing infrastructure to
18 further support limited introduction of light and
19 heavy duty vehicles as well as stationary
20 applications.

21 Infrastructure will be phased in based
22 on vehicle and other application readiness. Phase
23 1 results will be reviewed in two years before
24 progressing to subsequent phases. I'll show you
25 what these phases are. The biennial review is

1 just reaffirmed here. It is called for in the
2 executive order.

3 I believe these are the last ones.
4 Vehicle introduction will depend on technology and
5 cost readiness and consumer acceptance. Issues
6 currently being address include energy storage,
7 fuel cell durability, and costs, significant
8 progress is required before wide-spread use is
9 possible. Everybody recognizes that the
10 technology that we have today is not the
11 technology that we are all going to own that when
12 President Bush said a child born today will be
13 able to drive a hydrogen vehicle. The vehicles
14 that we have now are not the vehicles that child
15 will drive.

16 Investment in infrastructure is
17 manageable and California, in cooperation with
18 energy companies, is ready and committed to
19 provide the necessary infrastructure as the
20 vehicles and other stationary applications are
21 introduced.

22 We felt like this was a strong signal
23 from our panel that if California is willing to
24 participate and lead with the California Hydrogen
25 Network that the energy companies will come in and

1 work with us to get the numbers of stations in
2 place for the phases that we are talking about.

3 The phases are Phase 1, 2, and 3.
4 Looking at light duty vehicles, 2,000 in
5 California or 10,000 in California and then 20,000
6 in California. These would be considered
7 different phases of commercialization along a
8 continuum.

9 The heavy duty vehicles would be 10,
10 100, and 300, and stationary and off-road
11 applications. These would include the idea of
12 energy stations where you would have maybe a fuel
13 cell that would provide electricity to a building,
14 but then you could take a slip stream of hydrogen
15 and use it to fuel vehicles. This way you are
16 getting a lot of utilization out of the hydrogen
17 until you are ready for the vehicles to come
18 along.

19 What we did determine, though, is in
20 Phase 1, 50 to 100 stations would be necessary to
21 support these Phase 1 numbers of vehicles. I'll
22 show you how those would be located. In Phase 2,
23 we would need 250 hydrogen stations, and in Phase
24 3, the same number of stations, double the numbers
25 of light duty vehicles.

1 There is a station introduction strategy
2 of philosophy that is accepted is that you would
3 concentrate these stations in urban areas. What
4 happens is you create a network instead of
5 isolated demonstrations, so you are learning quite
6 a bit more than just putting in a hydrogen station
7 and putting a few cars right there at that station
8 to use it.

9 It is more about geographical coverage.
10 It is more about being able to get to a station
11 and feel confident that you can get to a station
12 instead of just blanketed the state with stations
13 in sort of a Harry Cary manor. Then we want to
14 link these stations, link the urban centers, and
15 then that is when we want to expand the network of
16 stations throughout the region.

17 When I talk about the region, in
18 California, we can talk about mostly with state
19 boundaries because California is mostly drive
20 within California. That is one of the reasons
21 that makes California such a good location to
22 bring hydrogen and those types of vehicles.

23 We also have a philosophy on our station
24 mix. I am going to talk about station mix. It is
25 the variety of pathways that would produce

1 hydrogen. Of course, we want a low cost option,
2 but we don't want the lowest cost option because
3 that is not going to give us the environmental
4 benefits that we are looking for and possibly not
5 give us the economic benefits down the road.

6 We would look at and we have looked at
7 what is existing, what is planned particularly
8 within the Department of Energy's program. Then
9 we want to start thinking about putting in a
10 variety of hydrogen pathways. We don't want to
11 pick winners at this point. And then also once
12 you get that mix of stations, we want to meet
13 specific greenhouse gas and renewable guidelines
14 or goals for the network. We would like to see 30
15 percent reduction in greenhouse gas emissions for
16 that network and vehicles versus if we just had
17 the traditional petroleum infrastructure and
18 gasoline ICEV's.

19 This is just a map of how it looks when
20 you concentrate the stations within the Northern
21 California and Southern California. This is for
22 50 stations. This is for 250 stations, and what
23 happens here, this is some work that we did with
24 UC Davis and UCLA students. What you find is by
25 using this philosophy with 250 stations, I'm never

1 more than five minutes from a station as long as I
2 am in these areas. So, that gives me quite a bit
3 confidence that I can go to the vet, I can go to
4 the grocery store, I can go to my mother's house,
5 and I can still get around. I don't have to plan
6 my day around getting fuel.

7 Finally, bridging. You would just need
8 a certain number of vehicles up and down the state
9 to make sure if I wanted to visit my friends in
10 Los Angeles, I can get down there in my hydrogen
11 car.

12 The Action Plan. The action plan is a
13 set of objectives, a set of activities that the
14 California Hydrogen Network will propose to the
15 governor in January that we begin immediately.
16 You can see this timeline that we have the
17 executive order has been signed, the blueprint
18 plan is almost ready. We believe, and our panel
19 has suggested to us very strongly, that they
20 believe Phase 1, the 50 to 100 stations, the 2,000
21 vehicles can be completed in the 2010 time frame.
22 We are not going to focus on 2010, what we are
23 focusing on is this continuum, and you can see
24 that we have biennial reviews scheduled into here,
25 and we have our 250 station target in here.

1 Again, this is contingent on the biennial review.

2 If in two years we come back and we see
3 that the technology is not developing as we had
4 thought or it is developing faster because of the
5 leadership that this state has shown, then we
6 would adjust these numbers.

7 These are the elements of the action
8 plan to build the stations, to procure the
9 vehicles, to deploy other hydrogen fuel devices in
10 cooperation with stakeholders. You may have a
11 fleet of forklifts that operate on hydrogen at a
12 distribution center around here. They would fuel
13 at a station that would be located on site. That
14 owner may decide to open that hydrogen station up
15 to people like myself. It is on my way home, and
16 I can stop and use their hydrogen station that
17 they use for their forklifts.

18 Identify and execute strategies to site
19 the vehicles and insure end use. We don't
20 vehicles that just sit. We don't want there to be
21 not enough vehicles for the hydrogen and so forth.

22 Formalize the centralized public/private
23 partnership and develop organizational structure.
24 We will build on the structure that you saw
25 earlier with our advisory panel and our senior

1 review committee.

2 Establish firm goals, objective,
3 initiate an immediate outreach plan. Jeremy
4 Rifkin said that he believes that we are on the
5 verge of the next industrial revolution. In order
6 to accomplish the next revolution, we will need
7 not only industry and government to work together,
8 but we need civil society as well. This is why we
9 believe that an outreach plan is key.

10 Draft and pass legislation. We have a
11 whole series of items that we believe need
12 legislation. Anything that we think we can do
13 with regulatory action, we have eliminated. I
14 won't go through those unless you really want to
15 see them.

16 Plant and implement those biennial
17 reviews. I just cannot stress how important those
18 are going to be to us. We have a timeline and you
19 can see that some of these activities are
20 consecutive. Some will happen in parallel.

21 We are not doing this in a vacuum.
22 You have public policy put forth by the Air
23 Resources Board, the Energy Commission, the
24 California Fuel Cell Partnership, the California
25 Stationary Fuel Cell Collaborative, DOE Freedom

1 Car, and of course the activities going on at
2 South Coast, so we are very cognoscente of all
3 these different activities and want to work within
4 a framework that incorporates in an advantageous
5 manner the different activities of these groups.

6 Some of the ideas that we have talked
7 about that would be above and beyond the minimum
8 of getting this network going would be the idea of
9 enterprise zones. Maybe we would pick places like
10 the Port of Los Angeles or the Port of Oakland
11 that have air quality issues. Maybe we would do
12 some demonstrations in those areas and expand out
13 around into the surrounding community. There
14 would just be kind of a California Hydrogen
15 Community and Enterprise Zone where you could show
16 off how the hydrogen can benefit not only the
17 industry but in the surrounding communities.

18 High level demonstrations. These are
19 for not only proving out the technology, but also
20 acquainting the public with the technology so that
21 people -- if you go over to the California Fuel
22 Cell Partnership, you will see at times groups of
23 kids all crowded around trying to see how does the
24 hydrogen fueling work. I think that makes a
25 strong statement that people are comfortable

1 enough to have their kids standing right there
2 while that hydrogen fueling is going on. People
3 talk about the Hindenburg and so forth, I think
4 that people are much more comfortable with this
5 and will be when they see that the government and
6 that industry is on board than some folks think
7 now.

8 One of the things here is perhaps a
9 multi-city demonstration project where you would
10 have contiguous cities with transit agencies.
11 Maybe you would run a hydrogen ICEV busses in each
12 of those cities, so theoretically, I could take a
13 hydrogen ICEV bus from Southern California all the
14 way up to Northern California. So, it would be a
15 high level demonstration project, high visibility.

16 Vehicle incentives. We have been told
17 that this is going to be very important. It sends
18 a very strong signal to the auto manufacturers
19 that California is committed to this endeavor.
20 Even though that they will be not significant when
21 you think about the true price differential
22 between the cars that we have and particularly
23 fuel cell vehicles.

24 Research and development. We believe
25 that this is also key for California. Keeping our

1 universities in a predominant position of
2 leadership. It also produces a work force of
3 educated folks that can fill high level jobs. It
4 sends a signal to industry, bring your businesses
5 here. This is where the educated work force is
6 that can do the jobs that you need. Plus I have
7 friends working in the Northeast for fuel cell
8 companies, and they say, we wish we could move to
9 California. It gets a little cold over there.

10 Quickly, the conclusions. This is a
11 broad initiative for diversifying transportation
12 energy use and for providing environmental and
13 economic benefits. This initiative will continue
14 to put California a world class leadership
15 position and position the state for successful
16 introduction of hydrogen technologies to meet
17 transportation, power generation, and other energy
18 demands in the future.

19 Again, this is something that I know
20 Commissioner Boyd is very cognoscente of is that
21 hydrogen brings together transportation, the power
22 sector, and the environment. The network should
23 be implemented in phases. The biennial review of
24 the blueprint will evaluate the pace with which
25 introduction should and can occur.

1 The state led public/private partnership
2 should begin work to implement the action plan.

3 The state needs to initiate a funding source.

4 With that, I will answer any questions.

5 PRESIDING MEMBER GEESMAN: Thank you
6 very much, Shannon. My primary question is how
7 have you gone about trying to coordinate
8 California's efforts with those of the federal
9 government in this area?

10 MS. BAXTER-CLEMMONS: We have had a high
11 level of Department of Energy and Department of
12 Transportation input into this plan. One of our
13 teams was led by someone from the Department of
14 Transportation. Steve Chalk from the Department
15 of Energy is on our advisory panel. They have
16 given me a fellow to work with on projects. So,
17 we are coordinating with Department of Energy, but
18 we are not letting them lead, and we are not going
19 to let them slow us down.

20 They think we are moving too fast, but
21 we believe that with the leadership shown in this
22 state, that the companies will see that California
23 is serious and maybe reallocate resources within
24 their companies. That is the signal that we are
25 getting, particularly from some of the OEM's.

1 PRESIDING MEMBER GEESMAN: You had
2 mentioned something about the coal and nuclear
3 aspects of the Bush Administration program, and
4 now you have also indicated a difference in
5 pacing. Are there any other secular differences
6 if you will between the state approach and that of
7 the federal government.

8 MS. BAXTER-CLEMMONS: I would say the
9 comments that we have received from the Department
10 of Energy on the latest plan and those were most
11 of our panel members got us something in, they
12 have to do with just being clear that the
13 technology is not ready now, that there are issues
14 with hydrogen storage, and that is going to be on
15 the ICV or the fuel cell vehicle. That the
16 biennial reviews are key to make sure that we pace
17 ourselves correctly and look for the right signals
18 from the technology sector.

19 PRESIDING MEMBER GEESMAN: When would
20 you look to be initiating that second biennial
21 review?

22 MS. BAXTER-CLEMMONS: This report is due
23 January 1, 2005, and the next report would be due
24 January 1, 2007.

25 PRESIDING MEMBER GEESMAN: How far in

1 advance of that are you likely to start up the
2 formal review process.

3 MS. BAXTER-CLEMMONS: I would have to
4 look to people that have done this more than I
5 have. This has been an amazing experience to in
6 eight months do a project that incorporates the
7 input, active input, of over 200 people. Mike
8 Eaves has been very active, Ben Ovshinsky, there
9 has been so many people in this room that we have
10 received input from.

11 I would have to rely on somebody that
12 knows a little bit more, but I would say that we
13 start planning at least a year in advance.

14 PRESIDING MEMBER GEESMAN: I want to
15 thank you for your contribution here today. We
16 certainly look forward to seeing the plan in early
17 January.

18 MS. BAXTER-CLEMMONS: Thank you very
19 much.

20 COMMISSIONER BOYD: Thanks, Shannon.

21 PRESIDING MEMBER GEESMAN: Okay, the
22 next one is Jon Van Bogart.

23 MR. VAN BOGART: Good afternoon. My
24 name is Jon Van Bogart, and I am with Clean Fuel
25 USA. We are a Clean Fuel USA partner here in

1 California along with Mutual Propane. My parent
2 company is Delta Liquid Energy. I would like to
3 share a little bit with you today making the case
4 for propane motor fuel in the State of California.

5 On the slide, on the left side is a
6 typical dispenser for Clean Fuel USA. Most of the
7 propane refueling network that you are used to out
8 in the marketplace doesn't look like this
9 dispenser. This is a Gilbarco dispenser, it looks
10 just like the dispenser that is in the gas
11 station. It takes a credit card, it has a credit
12 card reader in it. The customers come up and wipe
13 their card, put in a pin code, fuel themselves,
14 and go on their way.

15 We are trying to make the fueling
16 network as transparent as possible and convenient
17 to the users as is gasoline or diesel fuel.

18 Based out of Georgetown, Texas we have
19 partnered with Conoco Phillips in the State of
20 Colorado and also Texas in putting propane fuel on
21 the island with gasoline and diesel is a
22 significant advancement for alternative fuels.

23 The vehicle in the middle, fueling the
24 fleet, the State of California currently operates
25 about 1,600 of these vehicles. They are bi-fuel

1 vehicles, so they can run on gasoline or propane.
2 We have been lucky enough to be partnering with
3 the Energy Commission on their alternative fuel
4 refueling infrastructure program, and we have
5 received funding to put up about 24 stations in
6 the State of California, primarily to fuel these
7 vehicles. Build it and they will come and then go
8 after additional fleets.

9 We have found when we have put up the
10 refueling infrasture along Highway 101 in the
11 Central Coast, San Luis Obispo, we have had very
12 good participation wit the Cal Trans offices
13 there. This know this is something that is coming
14 down the pike. They are excited about using
15 alternative fuels, and we are seeing some pretty
16 good through put with the limited amount of
17 stations that are up now. There are seven, and by
18 the end of 2005, beginning 2006, we should have 24
19 stations up.

20 The fuel. There is the molecule over
21 there. Propane is a pretty simple hydro-carbon,
22 it is a C₃H₈. It does have some characteristics
23 to be one of the fuels that are going to help in
24 the hydrogen age. The State of Texas is now
25 partnering with the Railroad Commission in the

1 Texas Department of Transportation to use propane
2 to make their hydrogen fueling because they can
3 put it on a skid mount package. The propane fuels
4 the fuel cell which runs the reformer and also the
5 dispenser on the other side is your hydrogen, and
6 on this side is your propane. So, you've got a
7 dual site for relatively the same cost, just one
8 hydrogen site. You can have two alternative
9 fuels. That is a technology that we are at this
10 point letting the State of Texas run with and
11 pretty exciting stuff for us on that.

12 Propane is the No. 1 alternative fuel
13 world wide as far as energy sources go. Petroleum
14 is No. 1, natural gas is No. 2, and propane is No.
15 3 as far as an energy.

16 As far as transportation fuel, propane
17 is the No. 1 transportation fuel as far as an
18 alternative fuel in the world. There is more than
19 eight million vehicles currently running on
20 propane, utilizing 18 billion gallons of propane
21 worldwide.

22 Both the Us and world markets are
23 projecting abundant supply of propane because of
24 the supply and demand markets with natural gas and
25 petroleum. Propane is a consequence or a bi-

1 product of both of those products. The more
2 natural gas and petroleum that is produced, the
3 more propane you are going to have, so it is a
4 fuel that is going to be around for a long long
5 time. The Propane Education Research Council,
6 they are doing a lot of work on developing new
7 clean sources for propane.

8 Propane is easily distributed throughout
9 the market place. If you can get a tractor
10 trailer or a bobtail into a location, you can have
11 fueling infrastructure on the ground. It doesn't
12 need a pipeline, although there is a lot of
13 pipelines on the East Coast that transport
14 propane. Propane is easily delivered by a truck.

15 The infrastructure of the cost
16 effectiveness, the slide before with the card
17 reader system, is about \$100,000. That is about
18 the same price as a gasoline pump when you are
19 going to put it on an island. So, the
20 infrastructure is very cost effective and it is
21 something that gas stations are used to as far as
22 that cost.

23 The gas savings on the fuel cost.
24 Historically, propane has been about 70 percent of
25 the price of gasoline. So, it has traditionally

1 been less expensive, and I will have a slide up
2 later that will share a little bit more about
3 that.

4 It is a clean burning fuel obviously
5 because it is a simple hydro-carbon, and it has an
6 economic and both environmental benefits to the
7 fuel.

8 This is a slide here that shows the
9 world growth of propane in the motor fuel segment.
10 So, you can see that around the world, propane is
11 growing. I think right now this is last year,
12 although this slide -- I guess it is 2004, 4
13 percent increase last year. We rank 9th in 38
14 countries around the world in using propane motor
15 fuel. As you can see the US, 223 million gallons.
16 Here in California is about 22 million gallons,
17 those are gasoline gallon equivalent numbers.

18 This is the market on vehicles, it is
19 also increasing. Although this slide only goes to
20 2002, we know that it is more than 8 million
21 vehicles now. By the end of 2006, they are
22 projecting over 9 million vehicles world wide.

23 The current price of petroleum around
24 the world is really driving the alternative fuels
25 market in Europe. I know that John's presentation

1 earlier he had mentioned he showed the pie chart
2 of Europe. The biggest piece of that pie was
3 missing because it is propane. Propane is widely
4 used in Europe, it is the No. 1 fuel there also
5 Australia and Asia as well.

6 Refueling infrastructure. This goes to
7 2002. We know it is about 40,000 stations world
8 wide. So, this is a growing trend around the
9 world.

10 Here in California, in partnering with
11 the Energy Commission and putting up some fueling
12 sites, these are the locations that we have
13 planned. We have also partnered with the US
14 Department of Energy with a clean cities group.
15 We have six stations going in here in Sacramento
16 and an additional six going into Los Angeles.

17 We feel that it is going to take to
18 build a adequate refueling infrastructure for the
19 State of California, it is going to take about 80
20 stations. Because propane vehicles have very good
21 range, the tank size, the range of the vehicle,
22 the BTU content of the fuel is very similar to
23 gasoline, your stations can be a little bit
24 further apart. We are targeting on fleets. We
25 are looking at state and municipal and federal

1 fleets. Their characteristics of fueling enables
2 us to do that.

3 We also think it is going to take three
4 rail terminals. We currently have one in
5 operation. We are currently working on developing
6 two more and about ten strategic fueling storage
7 facilities because all propane is not created
8 equal.

9 Here in the State of California, the
10 California Air Resources Board and even on the
11 federal level, they require a certain quality of
12 propane. So, it depends on where you get that
13 product from. So, at Clean Fuel USA what we
14 decided to do is build a stand-alone network so we
15 can control that fuel from where it is being
16 produced until it goes into the tank of the
17 vehicle so we can assure that fuel quality.

18 This is a typical station here on the
19 island. This one happens to be at the Austin
20 Airport. In partnering with Conoco Phillips, this
21 is our Denver station on the right. We are
22 creating partnerships with them, so we can get
23 some signage out there. This is an important
24 development for alternative fuels to get on the
25 island.

1 Throughput for Clean Fuel USA. Right
2 now we are a little over 200,000 gallons that we
3 are putting through the system right now in the
4 State of California. You can see the yellow
5 boxes, the important box because of SB 1170 and
6 2076. What we are really trying to do is focus on
7 those state fleet vehicles. We are projecting by
8 2006 approaching close to a million gallons after
9 we get our stations up and running.

10 Delta Liquid Energy of course and Mutual
11 Propane are the two Clean Fuel USA California
12 partners.

13 The market dynamics here in California.
14 As you can see in 1999, we had 10,000 more
15 vehicles than we currently have on the road today.
16 We've lost some gallons too. That is primarily
17 due to the certification process regulations that
18 CARB has in place. We respect those regulations.
19 We think that the emissions benefits effect all
20 Californians. It has become quite, how should I
21 say this, cost ineffective for companies to
22 certify vehicles in the State of California now
23 that OEM's have gone the way of hybrids and
24 others, alternative fuel vehicles, we don't have
25 as many options as we used to.

1 If I can drive one point home today, it
2 would be that if the State of California can
3 engage industry in reducing the cost, not
4 compromising on the emissions mind you, but
5 reducing the cost of certifying vehicles in the
6 State of California, because as we heard from
7 Shannon earlier, hydrogen is the fuel of the
8 future, and everyone is driving to that point.

9 Between now and then, we have a lot of
10 work to do. Between C & G vehicles and propane
11 vehicles, that offer is probably our best
12 reduction efforts to reduce petroleum and also
13 emissions. This is a key slide, so we have
14 actually lost some ground, but we have partnered
15 with General Motors. They are producing some
16 gaseous prep platforms, which is exciting news,
17 and we will be able to convert those vehicles.

18 Sorry about the quality of the slide on
19 this one, this is a test project between John Deer
20 and the Southwest Research and the State of Texas
21 where they are applying propane technology to
22 diesel engines. Some pretty interesting things,
23 noise reduction, also emission reductions with
24 propane, very similar to natural gas. They are
25 very very clean fuels.

1 NOX and PM in California are big
2 numbers. These are Tier 3 numbers. We are
3 already meeting 2008 emission standards. Also the
4 efficiency of the fuel. Although the tractor runs
5 at a steady RPM of 24 RPM, there is less than a
6 one percent on the efficiency of the fuel with the
7 tractor, which was very good because when you are
8 talking and you are trying to compete with diesel
9 on a BTU content in efficiency, that is one of the
10 reasons why a lot of people use diesel because it
11 is pretty darn inexpensive and it is pretty
12 efficient.

13 Current market barriers. The lack of
14 refueling infrastructure with Clean Fuel USA in
15 partnering with the Energy Commission and also the
16 Department of Energy, we are trying to resolve
17 that.

18 Like I said, we will need about 80
19 stations and we will by the end of next year, we
20 will be 25 percent home with our stations.

21 Propane vehicles. Again, this is
22 something we really need to work on with the state
23 in partnering to reduce the financial obligations
24 that it is going to take for a small company to
25 get vehicles certified. OEM manufacturers, they

1 just can't afford it.

2 In 49 states today you can buy over 30
3 vehicles that will be available on propane. They
4 are available today but not in the State of
5 California because some of the CARB regulations,
6 so overcoming those is going to be important.

7 Also the lack of safety training and
8 things with the state. We are working with the
9 state with our industry to develop education and
10 training programs so they become more comfortable
11 with the fuel and the refueling aspects. The
12 goals of the industry obviously is to develop more
13 infrastructure, work with the state to get more
14 vehicles certified. The State of Texas has
15 partnered with a Propane Vehicle Council to where
16 the state will say, okay, we need these medium
17 duty vehicle platforms for our fleet, so we are
18 going to partner with you on projects to get those
19 certified. They have done that.

20 This is how to get in touch with us, and
21 these are our partners, Delta, Mutual, and Conoco
22 Phillips. This is actually the glacier bus 81.
23 GM mentioned it runs on propane and now it is
24 running up in Glacier National Park.

25 That is all I have, if somebody has some

1 questions.

2 PRESIDING MEMBER GEESMAN: Thanks very
3 much, Jon.

4 The next speaker is Mike Eaves.

5 MR. EAVES: Good afternoon,
6 Commissioners. My name is Mike Eaves. I am
7 speaking on behalf of the California Natural Gas
8 Vehicle Coalition and have an update of some
9 information that I presented earlier in October.

10 I would really like to talk about the
11 role that natural gas vehicles play in petroleum
12 diversity issue for California.

13 I'd like to talk a little bit about the
14 process to achieve goals, and then I will walk
15 through several of these in the course of the
16 presentation, but I think it is really important
17 that California codify the goals in state law that
18 are imbedded in AB 2076 report and the IEPR.

19 Secondly, I think we need to recognize
20 which fuels and approaches can get you which
21 gains. All fuels are not necessarily equal. They
22 don't necessarily address the same markets. As
23 Dave Modisette showed you, there is a significant
24 opportunity in electric transportation and other
25 fuels maybe don't necessarily go there. I think

1 we need to have developed some long term state
2 policies, and I will talk about why that is needed
3 and provide adequate incentives to facilitate the
4 market transformation.

5 John Boesel talked a lot about the or
6 gave a nice menu of state policies that we have
7 been working with him and other of the fuel
8 providers have been working with him on those
9 kinds of policy initiatives.

10 One of the concerns about the goals is
11 maybe that the Energy Commission is maybe grossly
12 underestimated the problem given the expected long
13 time frames to wrestle with the debate on CAFE,
14 and if those changes to CAFE aren't achieved in
15 the immediate time frame, it just exacerbates the
16 problem on petroleum down long term.

17 PRESIDING MEMBER GEESMAN: Let me add to
18 that. I have perceived absolutely no progress
19 whatsoever in the 18 months since we adopted our
20 recommendation on CAFE standards. So, those
21 targets we set in the 2076 report need to be
22 rolled out at least two years.

23 I also perceive a fairly formidable wall
24 of bipartisan opposition to much of an advance in
25 CAFE standards. That may change a bit, but thus

1 far, we haven't seen it.

2 MR. EAVES: That is why I say that maybe
3 as we go back and revise, look at the numbers that
4 maybe our problem is going to be larger sooner.

5 One of the things that is also stands
6 out is that given the world demand for petroleum
7 and what is happening in places like India or
8 China, there is a good potential of the things
9 that we do to solve the problems for ourselves,
10 don't necessarily alleviate the upward price
11 spiral on petroleum fuels. In that case, maybe
12 the alternative fuel goals for the state maybe
13 under projected of what they need to be.

14 As far as how we are going to achieve
15 this, the Energy Commission and the ARB and the
16 report look at two issues, vehicles and fuels.
17 The fuels, natural gas in the form of CNG and LNG
18 also it was discussed this morning whether
19 hythane-type products could be in there. Propane,
20 hydrogen, obviously there are other blends in
21 fuels and alcohol fuels and other potential neat
22 fuels, and obviously on the vehicle side we have
23 high-efficiency vehicles.

24 Some of the issues, though, I think -- I
25 am not going to go through all of these, but a

1 couple I do want to cover on blend fuel issues.

2 Blend fuels don't necessarily change the market
3 power equation for oil companies.

4 I know while I was here in October in a
5 workshop hearing and the Commissioners here
6 attended that, the beginning of that workshop and
7 also went over to a market power workshop, so
8 blend fuels will be sold as gasoline and/or
9 diesel. Once they are in that form, they sort of
10 lose their distinction of alternate fuels.

11 A couple of other issues are that
12 vertically integrated oil companies that rely on
13 themselves may be for blend stocks are potentially
14 looking at other entities that they are going to
15 be buying from, the alcohol producers and
16 everything are not necessarily underneath the oil
17 umbrellas, and gas to liquid producers are while
18 there are some oil companies that are pursuing gas
19 to liquids, there are a lot of independent
20 companies that are pursuing gas to liquids.

21 Increasing the blend ratios for these
22 blend stocks that have to be purchased by others
23 essentially drops oil company revenues. It
24 doesn't necessarily speak to the other issues that
25 you may have disruptions in corn or natural gas

1 for gas to liquid plants too.

2 High efficiency vehicles we have just
3 talked about the political obstacles of achieving
4 CAFE increases, but also there is revenue
5 reduction for the petroleum companies as the per
6 use per vehicle decreases and lower tax revenues
7 for the state based on lower consumption for
8 vehicle.

9 I know in the Kehoe legislation that
10 died in the Senate for the issue of lost revenue
11 was a significant obstacle that had to be
12 overcome.

13 PRESIDING MEMBER GEESMAN: The newly
14 appointed director of -- I don't believe it was
15 Cal Trans, the DMV has some ideas on changing the
16 revenue base for transportation related
17 expenditures.

18 MR. EAVES: Exactly. I am here to
19 really talk about natural gas, and I just want to
20 let you know that this is a list of the proven
21 markets for natural gas. We have been in the
22 transit business since the early '90's. School
23 buses since the early '90's with the Energy
24 Commission Safe Clean School Bus Program and
25 refuse trucks and heavy duty trucks, street

1 sweepers.

2 On the light duty side, we have compact
3 cars, and we have had large sedans, pick ups and
4 vans, and essentially, there is no vehicle product
5 where natural gas can't play a role and be used.

6 As far as market penetration, 30,000
7 total NGV's in California. I had to update mine
8 because the Energy Commission probably had a
9 better numbers than I did from DMV registrations.

10 We do have 5,000 of those heavy duty
11 vehicles. 25,000 light duty vehicles, and we are
12 displacing about 75 million gallons of petroleum
13 in the form of CNG and LNG and most of that
14 displacement is in CNG.

15 We do have a limited number of NGV
16 products. Jon just mentioned what is happening in
17 the propane vehicle markets with OEM's, natural
18 gas vehicles are suffering the same fate.
19 Variable or changing policies do absolutely
20 nothing to boost confidence in manufacturers of
21 sustaining production for long periods of time.

22 That is one of the things that I think
23 that politically we have to address in California.
24 There is a reluctance of manufacturers to expand
25 product lines if they don't see long term policies

1 and everything that favor certain approaches.

2 The other thing is that in Europe over
3 the last several years has -- the European union
4 has unified on their approach to greenhouse gas
5 issues and a fuel diversity issues and elevating
6 natural gas in their priority line of petroleum
7 displacement. What we have seen is that because
8 of those policies and because they are European
9 union wide, they have a situation where original
10 equipment manufacturers are going to offer eleven
11 new natural gas products into the market place in
12 2005 adding to about half dozen or dozen vehicle
13 types that are already in that market.

14 On California infrastructure, there are
15 currently 300 natural gas stations in California.
16 About 50 percent of those are public access. They
17 are either located at customer fleets, but they do
18 have public access that will allow you or I if we
19 had a natural gas vehicle to drive up to and
20 purchase fuel. While that only represents about 3
21 percent of the state's petroleum fueling network,
22 you have to realize that none of these stations
23 are joint ventured with petroleum companies.

24 On the infrastructure side, the
25 California NGV industry, the business model allows

1 for expansion of market without oil companies. We
2 did have all the major oil companies in the US
3 were engaged in NGV programs back in the early and
4 mid-90's and they have all terminated their
5 business in that area by the late 90's. So,
6 California that was left in an awkward position in
7 everything, we developed our business model to be
8 able pursue our market development objectives
9 without the participation of oil companies.

10 The notion that we need 10,000 fueling
11 stations to service a NGV market is incorrect.
12 The diesel market in California is well supplied
13 for hundreds of thousands of vehicles with a
14 network of about 1,000 stations.

15 The introduction of home refueling in
16 the NGV industry that will take place in early
17 2005 will also open up the opportunity for more
18 consumer-type acceptance of natural gas vehicles.

19 I think it is appropriate to look at a
20 couple of instances that are really success
21 stories in America. If you look at South America
22 in Brazil and Argentina, Brazil has got close to
23 900,000 vehicles with a network of 900 stations
24 and Argentina has 1.2 million vehicles with about
25 1,200 stations. That network is still growing.

1 In those two countries, they started out
2 essentially with zero natural gas vehicles about
3 five or six years ago, so that is the type of
4 growth that they have seen. It is also
5 interesting to note that all of those vehicles are
6 bi-fuel vehicles. Some of them are gasoline
7 vehicles and CNG, some of them are gasoline flex-
8 fuel, alcohol fuels and CNG.

9 From a policy standpoint, they price the
10 fuel, such as gasoline is at \$3.03 a gallon and
11 natural gas is \$1.25 a gallon. So, even if they
12 have flexible fuel vehicles, everyone is fueling
13 up with CNG that has those vehicles.

14 PRESIDING MEMBER GEESMAN: Do they rely
15 on the oil industry for their retail distribution
16 system.

17 MR. EAVES: Their retail distribution is
18 independent of the oil companies. It would
19 probably similarly marry what we are doing here in
20 California.

21 I know there is a lot of -- every time I
22 come to one of these forums, there is talk about
23 natural gas supply issues, and we've got growing
24 needs in California for natural gas for power
25 generation and for just the residential,

1 commercial, industrial market place. The reason
2 we have that is natural gas is one of the most
3 environmentally friendly fossil fuels to burn, but
4 the question is always how can you promote natural
5 gas vehicles when there is all these other growing
6 needs for natural gas.

7 Essentially, the demand growth for
8 natural gas in other markets is going to far
9 exceed what natural gas vehicles are projected to
10 do over the time frames that we are talking about.
11 In solving California's need for natural gas for
12 those applications is more than going to solve the
13 problem for natural gas vehicles. We are talking
14 about LNG imports, new pipeline, and potential
15 growth and expansion of renewables for natural gas
16 as John Boesel mentioned.

17 To put it all in perspective, a billion
18 gallons of natural gas displacing a billion
19 gallons of petroleum would equal about 5 percent
20 of California's natural gas use today.

21 Currently that 75 million gallons that
22 we are displacing is a little less than four
23 tenths of one percent of California's natural gas
24 consumption.

25 Natural gas vehicles can deliver. Our

1 focus has always been on high fuel use fleet
2 applications, but the infrastructure certainly has
3 a capability of adding a major consumer market
4 demand for natural gas. We see that we are at
5 5,000 heavy duty vehicles now. We see that we can
6 be at 30,000 heavy duty vehicles in 2020
7 displacing about 400 million gallons of petroleum
8 just in that application.

9 We think that 100,000 plus vehicles by
10 2030 is possible. Also that there is opportunity
11 given what we are seeing with Honda in the home
12 refueling appliance product that is coming out
13 next year. The first time application where Honda
14 will be marketing a natural gas vehicle to the
15 consumer which nobody has ever done that to date.

16 We believe that the potential for
17 500,000 to a million light duty vehicles
18 displacing upwards of 500 million gallons of
19 gasoline by 2030 is possible.

20 Now one of the things that we are
21 working with the Energy Commission and the Energy
22 Commission staff in conjunction with OEM's is
23 well, how can you make the projection for those
24 numbers of light duty vehicles given the track
25 record of light duty vehicles over the last ten

1 years.

2 The rationale is we have yet to see
3 market influences take over and catapult natural
4 gas vehicles into higher volume sales. We are
5 down -- every one is cognoscente of the hockey
6 shape curve that is flat on the bottom and then
7 rises. I think that OEM's perceive that the
8 market penetration of vehicles right now is not
9 adequate for you to see escalating consumer
10 demand.

11 Given good public policies that
12 encourage petroleum displacement, all of them
13 believe that they can start seeing market
14 penetrations in terms of in the case of Honda,
15 Honda says that they can envision that the demand
16 for natural gas vehicles can be very similar to
17 what they are seeing for hybrids. We know what
18 that is doing.

19 Our projections are that 10 percent
20 petroleum displacement by 2030 is very doable for
21 this industry.

22 Let's look at policies. We are changing
23 policies in California, and we are going from an
24 emissions and environmental policy drivers to
25 energy security petroleum displacement, greenhouse

1 gas policy drivers. That in no way means that the
2 emissions and environmental issues go away, it
3 just means that if you look at the environmental
4 regulations for gasoline and diesel vehicles
5 beyond the 2010 time frame, essentially California
6 is going to be clean fuels. Anything that is used
7 in California will be clean fuels. Now we have to
8 consolidate those gains, but look at other policy
9 drivers that need to be implemented.

10 The NGV market development has been
11 spurred by a number of federal and state policies
12 and/or programs. Probably the first of those was
13 EPACT in '92, but the Energy Commission has
14 certainly been involved in a number of programs
15 that natural gas vehicles have played a prominent
16 part.

17 The PUC has been involved in launching
18 low emission vehicle programs for the California
19 utilities, and the Air Resources Board programs
20 really place premium on lower and lower emissions.
21 That has been a great incentive to the NGV
22 industry. Key amongst that is the Carl Moyer
23 program, and the South Coast fleet rules have also
24 been great policy stimulus' to the NGV market.

25 Doesn't this look familiar? We've got

1 the Energy Policy Act of '92, goals were for
2 energy security and diversity, petroleum
3 displacement of 10 and 30 percent. That policy
4 was flawed in the design. It was focused on light
5 duty and many of the potential alternative fuels
6 that could have been implemented back in the '90's
7 and everything were all heavy duty oriented.
8 There was a lot of monitoring but no enforcement.

9 Now we have the AB 2076 goals, and I
10 hope that we are not 12 years from now looking at
11 California's Energy Policy and thinking it is in
12 the same state of disarray as EPACT is.

13 Let's take a look at EPACT's impact on
14 California. It did spur the purchase of bi-fuel
15 and flex-fuel vehicles that never displaced
16 petroleum. The mind set was fixed on how to
17 comply, but not how to achieve the objectives
18 behind the regulations which were petroleum
19 displacement.

20 The California policy's really support
21 emission reductions but not necessarily petroleum
22 displacements.

23 Potentially, what we need is a
24 California Energy Policy Act focused on petroleum
25 displacement, parallel focus on greenhouse gases

1 now that we have the Pavely legislation has been
2 signed into law and signed by the governor. We
3 need to look at heavy duty as well as light duty
4 vehicles. We can't have one focus like EPACT did.
5 We need to look at off-road as well as on-road.

6 We need incentives to encourage market
7 transformation. There is no way that alternative
8 fuels can necessarily go head to head without some
9 types of incentives and everything to encourage
10 that to happen.

11 If we go back to the Energy Policy Act
12 and take a look at California State Vehicle
13 purchases, this was from a CEC report that was
14 done looking at the 2001-2002 state purchases.
15 Only 24 percent of the vehicles purchased by the
16 state in those years, which was about 4,800
17 vehicles, only 24 percent were really subject to
18 EPACT. Only 19 percent of the vehicles purchased
19 were alternative fuels, but 65 percent of the 76
20 percent that were not subject to EPACT, all had a
21 viable alternative fuel option, natural gas option
22 in the marketplace.

23 The track record of zero percent
24 vehicles ending up using alternative fuels, and
25 that may be a little bit of an exaggeration

1 because John has been working hard on the propane
2 fueling, so zero maybe underrepresented there.

3 On the incentive, John Boesel talked a
4 little bit about this this morning, but the Moyer
5 program has been a major program in California for
6 emission reductions, and that is now projected to
7 be funded at \$130 plus million dollars for about
8 ten years. An interesting thing is in about five
9 years, 2010 when California and federal standards
10 on diesel engines are extremely low, the
11 environmental advantage of natural gas over diesel
12 may disappear. I say "may" because I think
13 natural gas is projected to get there sooner and
14 diesel may end up getting there later, but that is
15 another debate.

16 I think we need as John mentioned this
17 morning a Moyer type program needed to incent
18 alternative fuels and offer the greatest
19 percentage of incentives to those kinds of fuels
20 that displace petroleum 100 percent.

21 Again, back to my initial
22 recommendations. I think we need to codify all of
23 AB 2076 goals as state law. I know we took a stab
24 at that last year just looking at petroleum
25 reduction, but I think we need to place into the

1 record alternative fuel goals for the state.

2 Then we also have to decide who at the
3 state level would administer an all-fuel policy
4 and be the referee in those debates. We need to
5 develop long-range policies for California to give
6 manufacturers the kind of confidence they need
7 that this is not a two-year whim. I would like to
8 see things maybe codified into state law that we
9 can build other policies on so they are not
10 subject to things like executive orders that can
11 be changed down the road.

12 I think there is an extreme need to
13 still have the State of California in RND for new
14 generations of products and vehicles and that was
15 again mentioned this morning by John.

16 That is the end of my presentation. I'd
17 be happy to take any questions.

18 PRESIDING MEMBER GEESMAN: You mentioned
19 in the European union, and I wasn't able to ask
20 you what the current number of vehicles is in the
21 EU, do you have a sense?

22 MR. EAVES: I have that.

23 PRESIDING MEMBER GEESMAN: If it is not
24 on the tip of your finger --

25 MR. EAVES: No, there is probably close

1 to half a million vehicles in Europe.

2 PRESIDING MEMBER GEESMAN: What kind of
3 programs have they used to commercialize their
4 technology?

5 MR. EAVES: The largest program in
6 Europe is really the Italians, and the Italians,
7 they have been at that program for years. That
8 program was looking at the economics of petroleum
9 versus natural gas, whatever their domestic
10 prices.

11 The new round of thinking in the
12 European union is really on greenhouse gases and
13 looking at the fact that natural vehicles in the
14 light duty arena make an upfront 20 percent
15 reduction in greenhouse gases. That is embedded
16 in their long term greenhouse gas strategy.

17 PRESIDING MEMBER GEESMAN: Thanks very
18 much, Mike.

19 MR. EAVES: Thank you.

20 MR. FONG: Commissioner Geesman, I
21 remember earlier today you mentioned to me that
22 you might want to check those individuals who
23 submitted blue cards to see if they might have any
24 time constraints. Are there?

25 PRESIDING MEMBER GEESMAN: I've got

1 three more of our scheduled speakers, and then
2 I've got four blue cards, so we are probably here
3 for another hour and a half. Ed?

4 MR. FONG: That is Ed Kjaer from
5 Southern California Edison.

6 PRESIDING MEMBER GEESMAN: Why don't you
7 come up next then Ed.

8 MR. KJAER: Thank you. I very much
9 appreciate the Commission has adjusted the time in
10 allowing me to come and speak before you.

11 My name is Edward Kjaer, and I manage
12 Southern California Edison's Advance Clean Low
13 Emission Vehicle Transportation Programs.

14 I welcome very much the opportunity to
15 speak here today. I also serve with Commissioner
16 Boyd on Governor Schwarzenegger's Hydrogen Highway
17 blueprint plan along with Ms. Cynthia Verdugo-
18 Peralta from the Air District.

19 I am going to focus my comments today
20 primarily on load management and energy efficiency
21 programs that we are currently running with
22 electro-drive.

23 We are going to take the panel back a
24 little bit to talking about electro-drive
25 technologies.

1 As Dave Modisette said in his prepared
2 remarks, there is about 800 MW, we believe there
3 is about 800 MW of connected load of electro-
4 drive already in the State of California today.

5 That is predominantly forklifts, tugs,
6 sweepers, scrubbers, etc. That represents we
7 believe about 300,000 pieces of electro-drive.

8 There is something in the order of 16 to
9 20 mobile source regulations today in the State of
10 California impacting our customers, and there is
11 about 20 more on the books. They are all
12 primarily driving as we have heard today from a
13 number of speakers, petroleum production, CO2
14 reduction and emissions reduction.

15 We also think that because of these
16 regulations and the 20 or so more on the books,
17 that there is going to be the inevitable growth in
18 load, in electricity load because of these
19 regulations.

20 The regulators and legislators like the
21 electro-drive because primarily it will
22 overachieve in terms of petroleum reduction and
23 emission reduction and CO2 reduction.

24 We think that there is this inevitable
25 load growth, and there is a tremendous opportunity

1 to permanently shift the load to off peak to
2 basically shape the load. I think Commissioner
3 Geesman, you acknowledged this early on this
4 morning with one of the speakers.

5 Today if you just look at Southern
6 California Edison, we think of that 800 MW of
7 connected load about 350 MW is connected in SCE's
8 service territory.

9 Now connected load may not be the best
10 way to look at what is truly the impacts of this
11 load. A way to look at it is to have a diversity
12 discount. We have with a number of studies that
13 we have conducted here recently, we have a lot of
14 new information which we are fully prepared to
15 share with the Commission.

16 We use now a factor of 70 percent, and
17 that is a real number based on customer analysis
18 that we have done in our service territory.

19 The actual impact of the existing load
20 today, and again, I stress it is existing and
21 growing is about 100 MW. The other thing that we
22 have found is that load is fairly consistent. It
23 is flat throughout the entire 24 hour period of
24 the day. Roughly about 30 percent is on peak
25 today.

1 If you look at the overall total energy
2 24/7 365 days a year of the existing electro-drive
3 load in SCE service territory, it is about 700,000
4 Kw hours.

5 If you look at it in terms of the summer
6 peak potential, you take the 105 MW, you multiply
7 that by six hours a day, 85 summer days, and you
8 will arrive at about 53 million Kwh -- I'm sorry,
9 that's 700, it must be 700 million Kwh. So, you
10 arrive at 53 million Kwh.

11 A total potential in terms of
12 permanently shifting the load to off peak. The
13 problem is that it seems as if the state doesn't
14 really focus on permanently shifting the load. We
15 have a number of programs in the state that are
16 designed to go after and interruptible load. SCE
17 has I think something in the order of 1,000 MW of
18 interruptible load. Energy efficiency programs to
19 reduce the consumption of energy through more
20 energy efficient technologies. We don't seem to
21 have anything that really truly motivates a
22 customer to drive the load permanently to off-
23 peak, and we think that is a tremendous
24 opportunity.

25 The only tools that are really there

1 today are the rates, the difference between the
2 on-peak rate and the off-peak rate. The thing
3 that we are finding through our studies is that
4 the cost differentials don't seem to be there.
5 The drivers don't seem to be there for a customer
6 to immediately see a bottom line benefit to
7 shifting load to off-peak. So, that is certainly
8 something we need to look at.

9 If you look at the data that we have
10 seen, we had to look at a number of customers, 200
11 Kwh or 200 Kwh, 500 Kwh customers and in the major
12 major customers, just using existing time of use
13 rates on-peak rates versus off-peak rate, a major
14 customer who shifted their forklift operation to
15 off-peak may only be saving about \$5,000 a year.
16 So, they've got 100 something forklifts in their
17 operation. We talked to them about the
18 intelligence of shifting to off-peak. It is a
19 reasonable amount of load, but yet it is only
20 about a \$5,000 benefit to them.

21 When they start to add on technology
22 like energy management systems and what you have,
23 it doesn't pencil out.

24 In terms of what SCE is doing. We are
25 first and foremost beginning to look at this whole

1 rate situation, and we would welcome the counsel
2 and support of the Energy Commission as we reach
3 out to the PUC to talk to them about this issue.
4 We really believe as a state we need to start
5 looking at permanent solutions, not necessarily
6 just solutions that we constantly have to
7 incentivize a customer to take an action every
8 year.

9 With permanent solutions such as
10 permanently moving the load to off-peak with a
11 clear pricing signal, we can take that benefit, so
12 we need to be looking at that.

13 The next thing is we are looking to
14 integrate our load management energy efficiency
15 programs for electro-drive into the existing
16 utility programs.

17 For instance, we are looking an
18 interruptible program for forklifts to integrate
19 into the utilities demand response program. It is
20 not a huge amount of load that we could contribute
21 today to our overall goals, but again, we believe
22 that load is going to grow over time. So, there
23 may be some opportunities there. There are some
24 technical issues with the chargers that we are
25 dealing with through our technical center out in

1 Pomona, but we think that there is an opportunity
2 there.

3 The other area of opportunity that we
4 have discovered is what we are calling parasitic
5 load that primarily these chargers, the vast
6 majority of charges in play today are dumb
7 chargers and dumb batteries, and they really don't
8 have a very smart relationship with each other at
9 all.

10 These chargers are just even when they
11 are not connected to a battery, they are still
12 drawing load. We think there is about 10 percent
13 reduction potential if you can remove that
14 parasitic load.

15 Charger profile management. This goes
16 back to the intelligence of the relationship
17 between the charger and the battery. We think
18 there is about 10 to 12 percent potential
19 reduction in load by adding some simple technology
20 to the charger and to the battery that allows for
21 a more appropriate charger algorithm than exist
22 today from the manufacturers.

23 So, parasitic load, a charger profile
24 management, both of those can get upwards of 20
25 percent reduction in energy, so we would put this

1 under the energy efficiency type programs.

2 The third area that we are looking at is
3 Energy Star. For intents and purposes, these are
4 appliances. I think there is a tremendous
5 opportunity as we have looked at air conditioning
6 and refrigeration that why can't there be an
7 Energy Star program for forklifts. So, we are
8 starting to reach out through our trade
9 associations, CAL ATC, EDTA, starting to talk to
10 the DOE about those kinds of opportunities.

11 Of course, then integrating into any
12 future load management programs like 20/20 coming
13 up here next summer. We also have -- you have
14 heard a lot about hybridization today. We also
15 have pretty effective light duty, medium duty, and
16 heavy duty hybrid truck programs in the utility to
17 help us with anticipated current and future
18 regulations.

19 You have heard about EPACT, you have
20 heard about heavy duty fleet roles. We will be
21 getting three prototype plug-in hybrid light duty
22 vehicle the first quarter of next year from
23 Daimler Chrysler. We are working to start a
24 medium duty hybrid boom truck program with our
25 friends from PG & E and EPRI. Then we participate

1 in John Boesel's H Tough Heavy Duty Hybrid Boom
2 Truck Program where we will receive two vehicles
3 towards the end of next year.

4 These are all efforts to understand
5 system impacts, to understand technology, and to
6 help utilities with future compliance, but it is
7 also in anticipation that this relationship
8 between the grid and transportation is only going
9 to become more and more connected. We are seeing
10 it with the load today and the anticipated load
11 growth of tomorrow.

12 I think that what we all need to start
13 to think about while load growth is not an ideal
14 situation in California with our generation
15 constraints, particularly with what we are
16 anticipating in '05 and '06, primarily if we are
17 pro-active and there are appropriate signals and
18 appropriate policy, this can be off-peak load.
19 That can be good. There is a distinction. I do
20 see a distinction between bad load growth and good
21 load growth, and I think the benefits are pretty
22 obvious there.

23 We believe that transportation clearly
24 has a role in this state's energy action plan, and
25 IEPA, and we are very encouraged that this

1 workshop is taking place today. We look forward
2 to working with the Commission and seeking your
3 help so we can work with the Public Utilities
4 Commission to grow these low emission vehicle
5 programs. We have to understand that the system
6 impacts of this ever increasing load. We have to
7 create the right policy and the right drivers to
8 modify existing customer's behavior and to drive
9 future load to off-peak because that benefits all
10 of us.

11 Finally, as Dave Modisette said in his
12 prepared remarks, electric drive can represent
13 significant petroleum reduction, CO2 reduction and
14 emissions reduction. So, the utilities very much
15 want to be a part of the solution in this area,
16 and we think that we can through our own actions
17 contribute and through helping our customers do
18 the right thing as well, contribute to those
19 goals.

20 Finally, there has been a lot of
21 discussion about Moyer today, and maybe we need
22 another Moyer type of program. Respectively what
23 I would suggest that what we all need to do I
24 think is work together to make Moyer even more
25 effective. Part of the frustration that all of us

1 who have dealt with Moyer over the years have is
2 that it takes a tremendous amount of time to push
3 applications through the system.

4 There has been examples of a year to get
5 an application through the system. No criticism
6 to anybody involved, but it is very difficult to
7 have a repeatable process if one of the stumbling
8 blocks is it just takes too much effort and too
9 much time and too many resources to get proposals
10 through the Moyer program. It is a tremendous
11 tool. It now has a significant resource. It
12 appears to be an evergreen resource, so we've got
13 to be I think all working together to try and make
14 Moyer more effective.

15 That concludes my remarks. Thank you.

16 PRESIDING MEMBER GEESMAN: Thank you,
17 Ed, for some very thoughtful comments. I think we
18 can build on this quite a bit. I happen to
19 believe that what I characterize as load factor
20 improvement is certainly in the utilities best
21 interest and I think more general in the rate
22 payers best interest and in society's over all. I
23 think that may be a good bridge by which to get
24 your industry more directly involved in trying to
25 come to grips with California's transportation

1 problems. I certainly appreciate the work that
2 you've done before and welcome your continued
3 participation in our forum going forward.

4 MR. KJAER: Good, thank you.

5 COMMISSIONER BOYD: Thanks, Ed, good
6 comments.

7 PRESIDING MEMBER GEESMAN: Why don't we
8 go to Gordon Garry next.

9 MR. GARRY: Thanks for your time this
10 afternoon. I'm Gordon Garry. I am the Director
11 of Research and Analysis at the Sacramento Area
12 Council of Governments. We are the six county
13 metropolitan planning organization for the
14 Sacramento region.

15 I'd like to talk to you today about the
16 work we have been doing on integrating
17 transportation and land use planning and its
18 impacts on vehicle miles traveled. The study we
19 have just completed, which we are calling the
20 Sacramento Regional Blueprint Study was just
21 adopted by our Board of Directors last week and
22 sets the stage for next years work to implement
23 that transportation and land use vision at each of
24 the cities and counties in our six county region.

25 What I want to do is give you a little

1 overview of that process focusing on particularly
2 the vehicle miles traveled, findings that we came
3 to as part of that land use study, talk about some
4 of the analytical issues that we addressed and
5 took on as part of that study to help us come to
6 those conclusions and then some implementation
7 issues on both the land development as well as the
8 analytical side that we are moving forward to.

9 I'll try and work in some areas where I
10 think the Energy Commission can help out both our
11 region and more generally all the urban areas in
12 California as we sort of move towards these smart
13 growth and smarter growth land development
14 patterns.

15 The blueprint process was a 2 1/2 year
16 study that looked at alternatives to our current
17 land development process. We have until recently
18 had very little redevelopment. Most of the
19 residential growth has been in green field with
20 very little in fill. The result of which is
21 longer commutes, more vehicle miles traveled.
22 This is something that we all know and experience
23 every day.

24 Our Board of Directors and our land
25 transportation plan said we have to do something

1 about this. We have a transportation plan that
2 looked at over \$20 billion investment that
3 resulted in much greater congestion than we have
4 today. They didn't think that was an acceptable
5 outcome, and so they said what else can we do.

6 We looked at this land use question
7 which we have looked at in the past in a much more
8 cursory and much cruder fashion and decided how
9 can we do this better.

10 We did this better through one of the
11 tools that we used was something that the Energy
12 Commission has supported for a long time which is
13 the Places Program. We really appreciate the
14 support that the Commission has given to that
15 program. We have taken that and applied it very
16 thoroughly in both analytical as well as the
17 public outreach parts of our blueprint process and
18 has been very very useful. It has been a great
19 tool on both of those fronts to help us get to the
20 point we are at today.

21 We made improvements to both the Places
22 Program as well as also our regional travel
23 modeling program. The results that we came to
24 were what we did was compare -- we came down to a
25 comparison of two alternatives. We went through a

1 whole series of other alternatives that sort of
2 started from in our future, what if we just
3 continued to grow in the way we are growing now.
4 We laid out that, what we call the base case
5 scenario which is very sprawl, had a lot of green
6 field development, very little in fill and
7 redevelopment in existing urban core. We looked
8 at a number of alternatives to that, what our
9 Board adopted last week which we call our
10 blueprint preferred alternative has significantly
11 better transportation performance.

12 Both of these future years were for the
13 years were for the year 2050. We did a very long
14 range scenario for the main reason being, that it
15 takes a long time for land use impacts to be
16 reflected in travel choices and to show
17 significant changes.

18 I would recommend that the emphasis
19 shouldn't so much be on the fact that it is a 50
20 year study, but the fact that we are looking at a
21 probably 60 percent change in the population of
22 the region.

23 We went from about two million to about
24 3.7 million is what we are projecting to be in our
25 region by 2050.

1 Sort of the bottom line is that vehicle
2 miles traveled per household for our preferred
3 alternative versus our base case, the preferred
4 alternative was 26 percent lower VMT per household
5 in our base case and probably even more
6 surprising. It is something that we were
7 certainly not expecting but we are pleased to see
8 is it was also lower than the VMT per household
9 that we experience today. It is about 17 percent
10 lower than the VMT today. That is a major shift
11 from what we have experienced both in this region
12 and around the country over the past 30 years.

13 The VMT per household has been going up
14 in real terms as measured on the road by federal
15 highway and Cal Trans and all the other
16 transportation agencies.

17 We accomplished that through a change in
18 the land development pattern, particularly in
19 residential residence. Rather than large lot,
20 single family residential being the predominant
21 mode of residential. Went to a much broader mix
22 of both small lots single families as well as
23 mixed used, as well as attached housing.

24 The result of that being is that first
25 there was a significant shortening of average trip

1 length. We saw there was a 16 percent reduction
2 in average trip length of the base case compared
3 to the preferred alternative and a six percent
4 reduction compared to today.

5 All those dramatic reductions don't mean
6 that no one is going to travel. Even with the
7 blueprint, 84 percent of all trips are still by
8 automobile. Three percent were by transit and 13
9 percent were by walking and biking. Compared to
10 today, we have 1 percent in transit and about 7
11 percent walking and biking. So, it is a
12 significant but not overwhelming shift in modes
13 out of vehicles into these alternative modes.

14 The biggest impact we saw was that the
15 trip length was significantly reduced as opposed
16 to what we are seeing now which those trip lengths
17 are getting longer as land uses are -- what we
18 did in that study was look at how we can combine
19 those land uses and integrate them.

20 We also made significant changes in
21 transportation investments. We did a lot of
22 investment in our modeling. We put in a lot of
23 transit into that system to provide it as an
24 option for a much higher share of the regions
25 population than we currently have now. We are

1 going to be looking at that in more detail as we
2 move forward.

3 The way we got to those was like I said
4 was through the uses of places programs. The
5 fundamental place which our study had to start
6 with is not do it at some gross level, but to do
7 it at the most detailed level possible, that is
8 the parcel level of development. We developed a
9 parcel level of geographic information system for
10 our region and applied it through the places
11 program and through our other modeling and
12 analytical tools so we can look at those very
13 detailed, design, density, diversity issues on
14 both land use as well as the transportation side
15 to help us come to that improved analysis.

16 Not only did it help the analysis, it
17 also helped in the public outreach. A part of the
18 large success for the blueprint process has been
19 that we had an enormous public involvement
20 program. We had over 40 workshops. We had over
21 5,000 participants who are hands on giving us
22 their feedback, seeing the impacts of the their
23 feedback in the places program is where that
24 became possible.

25 One of our recommendations to the

1 Commission is continued support of the Places
2 Program as we move forward both in the land use
3 and transportation side as well as all the other
4 features that are embedded in that program.

5 There are a number of proposals right
6 now to make further improvements and to also help
7 promote that program as a good community planning
8 tool that can be used throughout the region.

9 One of the benefits of that is the
10 bigger the user base is, the more support there is
11 going to be for further improvements across the
12 whole range of impacts.

13 As this region moves forward from the
14 adoption of that plan into implementation, how are
15 we going to find out is that vision actually
16 coming about, and are we actually realizing that
17 reduced travel need.

18 We are in the process of taking what was
19 this initial parcel based geographic information
20 system program and moving it into a monitoring
21 phase where all of the land development that
22 happens in the region is monitored at the parcel
23 level. We are doing that through working with our
24 city and county partners in their GIS programs and
25 the first thing we are doing is setting up

1 standards and protocols so that everybody's
2 geographic information systems are on a same
3 platform, so that each jurisdiction, each
4 department in collecting can gather their own
5 information, but it is transferrable to others
6 throughout the region. It can be mixed and
7 matched seamlessly. Therefore, we don't have to
8 worry about is, is somebody else's data valid. It
9 can be put together in new applications can and
10 are being written that use data process in various
11 jurisdictions.

12 We are promoting the use of standards.
13 We think that is a great program because no one
14 can afford to build everybody's GIS data as well
15 as the data is most -- the quality of the data
16 will be the best if it is held by the agencies
17 that actually collect and use that information as
18 its primary purpose. It then becomes much more
19 useful for those who have it on a secondary
20 purpose.

21 That GIS framework then becomes the base
22 for which we want to start doing other regional
23 monitoring programs. Not only on land development
24 but on job and job creation and economic
25 development and travel and transportation systems,

1 so that all of these various programs can be --
2 because the data is often collected by various
3 agencies, but they are kept in their own formats,
4 they are not shareable, they are not
5 transferrable, we think there is a great potential
6 here to make all this data much more adaptable to
7 other uses, and we think there are great
8 analytical and monitoring benefits that can be
9 achieved by the promoting of these standards and
10 working together in the development of cooperative
11 efforts.

12 We are also going through some
13 improvements in our model development, on land use
14 models and on transportation models. One of the
15 ground breaking things that we found in this study
16 is that existing travel demand models that I use
17 every day at SACOG and other MPO's around the
18 country and around the state is they are
19 structurally unable to deal with a lot of the land
20 use issues.

21 We have pushed that envelope really as
22 far as we could, and we need a number of what are
23 called post processors to help improve that
24 connection between the land use and the
25 transportation, but we have sort of pushed that as

1 far as we can. We are moving into a new family, a
2 new generation of travel models that are
3 integrated with land use models and really work at
4 getting at that parcel level because you need that
5 level of detail.

6 GIS systems help you manage that
7 enormously large data need and lets you move
8 forward on both data management as well as the
9 analytical side. We are moving forward on that.

10 We are always looking for more support
11 in model development and data programs, so
12 anything that the Commission could do in that
13 regard either to help in fills directly or to work
14 with other state agencies like Cal Trans and
15 Housing and Community Development to help promote
16 those model developments and data programs we
17 would most appreciate.

18 Any questions about any of this? I'd be
19 happy to answer.

20 COMMISSIONER PFANNENSTIEL: One
21 question. You mentioned that the improvements
22 that you found in vehicle miles traveled seemed to
23 be from the two different factors that you put
24 into the model. One was the in fill housing and
25 so the shorter trips. The other was more mass

1 transit. Do you have a sense of which was more
2 important or how they weighed in terms of what
3 difference they made in the vehicle miles
4 traveled?

5 MR. GARRY: They are both very
6 important, and one without the other doesn't give
7 you -- it really is a synergy. By having higher
8 density and more mixed use, you do get more walk
9 and bike trips, but without a transit system
10 overlaid on that, you also get an enormous amount
11 of traffic congestion.

12 With transit and these land use
13 development pattern differences, you mitigate that
14 congestion to move it from an expected or an urban
15 congestion level toward those that are called grid
16 lock or multiple hour stop and go traffic
17 congestions. Really, they are both needed.

18 COMMISSIONER PFANNENSTIEL: Thank you.

19 PRESIDING MEMBER GEESMAN: I want to
20 thank you, Gordon, for your comments and work that
21 SACOG has done to take the Places Program to a new
22 plateau. I actually think you are one of the best
23 advertisements for broader propagation of that
24 program and its dissemination in the planning
25 community.

1 You speak of trying to promote its use
2 across the region, I take that to be the Western
3 region, if not the entire North American continent
4 because I think that it does have value. Our
5 first challenge should be trying to propagate it
6 more effectively within California.

7 Any work that you can do with your
8 colleagues at the other councils of governments
9 would be helpful. I also think that the planning
10 profession, in general, should give some thought
11 to how we best maintain the Places Program. What
12 is the appropriate environment or institutional
13 home for it?

14 The Energy Commission has done a good
15 job in developing the program and can make some
16 improvements to us, but I don't think we are set
17 up to be the best administrative home for it. I
18 think we would be quite receptive to suggestions
19 from the planning community on that because I
20 think all of my colleagues recognize the value
21 that the program has served and the important
22 impact it that it can have out in the field.

23 MR. GARRY: Yeah, I agree entirely. We
24 have talked about that too about how do we best
25 sort of move the program from one or two uses to a

1 much broader use of community and how does that
2 work and how is that supported. I think the
3 movement from it sort of stand alone application
4 into an interim application which is now and
5 should help that, but it also sort of gives us a
6 extra challenge for support and maintenance of the
7 overall not only software but the operating
8 framework as well.

9 I certainly salute you for the advances
10 that you have been able to make using this tool.

11 MR. GARRY: Thank you.

12 COMMISSIONER BOYD: I want to echo
13 Commissioner Geesman's comments. I was going to
14 jump up and thank you for referencing "Places" and
15 for using the program, but you very eloquently
16 stated anything I would have said and then more.
17 Just as a supporter and proponent of Places for
18 actually more years than I've worked here as a
19 Commissioner, I am glad to see the tool starting
20 to be used. I agree completely that it needs to
21 be propagated more out into the planning community
22 and echo his sentiments about your helping us move
23 that into your community. Thank you very much.

24 MR. GARRY: Our blueprint project would
25 not have been nearly as successful as it has been

1 without the Places Program, both the technical as
2 well as the community outreach aspects. It was
3 invaluable.

4 PRESIDING MEMBER GEESMAN: Thanks again.

5 MR. GARRY: Thank you.

6 PRESIDING MEMBER GEESMAN: The next
7 speaker is Jamie Levin from AC Transit.

8 MR. LEVIN: Members of the Commission,
9 Commissioner Boyd in particular, thank you very
10 much for inviting public transit to come and give
11 its perspective on how to address these challenges
12 of energy efficiency and ultimately we hope energy
13 sustainability.

14 Our program at AC Transit is defined as
15 taking the "HY" road, and that really reflects our
16 interest in two very primary technologies, which
17 we think can make some difference in addressing
18 these challenges.

19 One is hybrid or hybrid applications
20 within our fleet and the other is hydrogen. I'll
21 take you through what we are doing at AC Transit.

22 This presentation is based on one that
23 was made several weeks ago for CalStart, John
24 Boesel's conference in Southern California dealing
25 with reductions in oil consumption. I think the

1 basic question that we asked is can transit really
2 make a difference, and I think this alludes to the
3 prior speaker and the Commissioner's question
4 about the role of transit in reducing vehicle
5 miles traveled.

6 I'll be less dramatic than I was when I
7 was in Pasadena and near Hollywood where I
8 actually put on a pair of rose colored glasses to
9 demonstrate that one of our own industries
10 failures or weaknesses I should say is we always
11 like to talk about how ridership is increasing.
12 Not that it isn't going down and up and all over
13 the board, but typically we are very great about
14 pounding our chests and telling the public that
15 our ridership is up.

16 In AC Transit's case, dealing with the
17 impact of the economy over the last 3 1/2 years,
18 we have actually had to cut significant amount of
19 service. That is very typical of many transit
20 systems around the country, especially in
21 California.

22 While we were cutting, we also had an
23 increase in ridership and we have been very proud
24 of that, but the facts of the case are that as a
25 previous speaker spoke to the growth of vehicle

1 miles traveled, you look at the DOT numbers in
2 growth between 1960 and 2000 and it is on a pretty
3 heavy very steep curve looking at vehicle miles
4 traveled that if you looked at those vehicle miles
5 traveled on a world-wide level and started
6 considering the growth of automobile usage in
7 China and India, two developing countries, this
8 country and our communities really are in
9 competition with a growing demand for petroleum
10 and energy that have to face. We are facing that
11 now on many different levels not the least of
12 which is the GO political challenges of fighting
13 wars in other countries to deal in part energy
14 needs.

15 As you can see here, the area of vehicle
16 miles traveled growth is pretty much follows the
17 pattern within the US, and this is what is
18 daunting and rather unsettling. The fact is if
19 you look at total auto person trips, they are
20 growing right along with total vehicle miles
21 traveled.

22 Take a look at transit and the role that
23 transit plays. It is pretty much flat. We are not
24 making much of a difference in terms of the
25 overall challenges. If you look at this travel to

1 work market share from the US Census Journey to
2 Work, we are going in the wrong direction.

3 In the United States, our market share
4 is decreasing whereas drive alone share is
5 growing, and I believe the previous speaker spoke
6 to the market share here in the Sacramento region
7 is somewhere around 1 percent. You don't even
8 qualify to fit on this table. I think that is a
9 huge challenge that we have to deal with.

10 How does transit make a difference. I
11 would like to look or think of our service as
12 being sandwiched between two critical programs.
13 One is the program of accessibility, and the
14 previous speaker really discussing how land use
15 can effect people's trip making behavior I think
16 is extremely important. We define it as
17 accessibility, not mobility, but accessibility.
18 Having jobs and home base travel near one another
19 so that it is far easier to take transit, to walk,
20 to use your bicycle. That is a critical component
21 to making any transit service really work
22 effectively.

23 At the bottom end, and it is really not
24 the bottom end, it is the sandwich, it is the two
25 elements to making transit work is political and

1 financial support, and I will explain by what I
2 mean by that further on.

3 There are four components to making
4 transit service really workable. One is
5 convenience. If it is not convenient, you are not
6 going to board a public transit vehicle to get
7 from home to work or for other kinds of trips.

8 Travel time, very critical that it is
9 actually a quick period of time to get from here
10 to there.

11 Comfort and image is another component,
12 and technology improvements is the fourth
13 component.

14 Accessibility or what we call critical
15 mass is far and above the most important driver.
16 We look at three principles. One is land use
17 generating trips that largely determine travel
18 behavior.

19 In our small role in this effort, AC
20 Transit soon will be releasing I think a very
21 important and seminal document that we have
22 titled, "Design with Transit, Making Transit
23 Integral to East Bay Communities", but it could be
24 applied to any communities.

25 Since we serve 13 cities in a fairly

1 large urban base, we are trying to find ways and
2 show those community ways to improve accessibility
3 to public transit.

4 How to make fixed route transit far more
5 efficient. I think this document will be in some
6 small part our effort to work more closely with
7 local communities to provide better land use
8 planning. Certainly the second principle here
9 which is the transportation systems really provide
10 mobility and access and do help influence land use
11 patterns.

12 The bottom line principle is its
13 critical mass, its population and density and
14 mixed use development. Both very necessary to
15 achieve the sustainable and efficient transport
16 goals.

17 To give you some background as to what
18 our challenge is in the Bay Area, we are one of 14
19 transit systems, and you can see this area here
20 which represents the 1.5 million people that we
21 serve in the Bay Area of almost 7 million people
22 giving you a break down of the number of
23 passengers that we carry and the size of our
24 system.

25 If you look at this map here which gives

1 you a sense of our grid network, which includes
2 trans-bay service over to San Francisco, some
3 recent service that we have inaugurated across the
4 San Mateo bridges, San Mateo Bridge and the
5 Dunbarton Bridge, we are developing a hydrogen
6 program, and these three gold dots reflect where
7 our hydrogen facilities, some of which are in
8 place, others which will be in place by the end of
9 this year.

10 The kinds of services that we are
11 focusing on to improve the attractiveness of
12 public transit include a major trans-bay
13 development program. We are building with in
14 partnership with Cal Trans with the City of San
15 Francisco and other organizations a new trans-bay
16 terminal and really increasing the robustness of
17 our express bus service.

18 We actually just recently launched a
19 program with Stanford University from the East Bay
20 over to Stanford that has been highly successful
21 in bringing more of the faculty and staff on
22 public transit to those facilities.

23 We are developing bus rapid transit
24 corridors which John Boesel might have spoken
25 about in this morning's presentation in which we

1 launched now a San Pablo bus rapid transit where
2 we have seen a 66 percent increase in ridership in
3 that corridor.

4 We are working on car share programs.
5 TransLink is a smart car technology to make it
6 easier to use all the transit systems within the
7 Bay Area seamlessly by utilizing this translink
8 feature.

9 We have launched programs with the
10 University of California in the City of Berkeley.
11 We are now serving well over 40,000 using a pass
12 program for AC Transit making easier to board our
13 services. That program is growing and has been
14 quite successful in increasing ridership.

15 Increasing point of travel information
16 like this next bus service that essentially
17 identifies when the actual arrival time of the
18 next couple of buses is coming. We are doing more
19 in terms of managing our service on the road
20 through GPS tracking of where our buses are.

21 I mentioned in the earlier part of the
22 presentation, our hydrogen and hybrid technology
23 efforts, we've been part of the Fuel Cell
24 Partnership for five years now. We've been
25 testing various buses and quite successfully over

1 the last several years. We now have this 20
2 million dollar program which we are quite thankful
3 that the Energy Commission has been extremely
4 supportive both at the staff level and at the
5 Board level in helping us raise our funds, keep
6 our funds as we are developing this program.

7 It not only involves public sector
8 participation, but we have several major
9 partnerships, the primary one being the
10 partnership with Chevron Texaco.

11 What motivates us in this effort is
12 primary first and primarily public health, how we
13 can deliver to the neighborhoods that we serve
14 that have high populations, high density,
15 especially populations at risk, specifically the
16 youth and senior citizens that have health
17 problems that really demand and need better
18 emissions in these urbanized areas.

19 To be able to replace a diesel bus, no
20 matter how efficient diesel buses are currently,
21 with a zero emission vehicle is I think a very
22 important goal for us, and it sets our drive and
23 desire to replace our fleet as soon as we can with
24 zero emission vehicles.

25 There are quality of life issues with

1 reduced noise levels, and we see cost savings
2 utilizing electric vehicles, the benefits that
3 those bring over a very complicated internal
4 combustion engine vehicle.

5 There are also these global issues which
6 some of the other speakers have already
7 referenced. I think suffice to say that we have
8 taken energy source petroleum that took millions
9 of years to develop and in the last 100 years, we
10 have gone way beyond very quickly where we are at
11 a point where we are utilizing all of those
12 resources and whether you think or agree that we
13 have reached our peak now or it is within 30 or 40
14 years, it is clear that we have to start on this
15 road presently and work towards a 30 to 40 year
16 solution.

17 AC Transit really sees itself playing a
18 role in terms of the zero emission program and
19 what we are doing in that area.

20 This obviously I think you are aware of,
21 the efficiencies of fuel cell technology. In
22 Toyota's analysis, they see a two to three times
23 fuel efficiency well to wheel utilizing hydrogen
24 and fuel cells.

25 Transit is an excellent test bed for

1 this technology because we can test it at its
2 limits, and we bring to the table centralized
3 facilities which works very nicely for the
4 hydrogen highway that Shannon spoke of earlier.

5 Our professional staff that is highly
6 committed to this program and then the visibility
7 of our technology that people can actually
8 experience what this technology means, what its
9 potential is. Our experience operating a
10 prototype bus in the last couple of years has been
11 really quite rewarding. Our public loves it, they
12 envision and desire more. If anything, we have to
13 manage expectations that they understand that it
14 is a long term development effort.

15 Uniquely we lead a team of three other
16 developers in the private sector, Van Hull who
17 makes our buses, UTC who makes the fuel cells, and
18 ISE Corporation here in California that does the
19 integration work for fuel cells, but also the
20 development work for heavy duty hybrids.

21 We, AC Transit, has really set the
22 pathway in terms of our operating specifications
23 and what we are looking to achieve in being able
24 to provide our service reliably to the community
25 that we serve.

1 We are building three 40 foot buses,
2 they will be delivered in the fall. These are not
3 cheap vehicles. They are \$3 million per vehicle
4 compared to \$300,000 diesel bus, but I like to
5 point out that the diesel bus has far more
6 emissions than the zero emission vehicle. Given
7 the current Air Resource Board emission standards,
8 we cannot buy a full-powered diesel engine as we
9 have in the past given those emissions.

10 We are working on a track to try and
11 improve our air quality with our fleet. Looking
12 at the last year this operation of a 30 foot
13 prototype with ISE and UTC's technology, I think
14 the key point to make here is that we achieve very
15 high levels of availability, 83 percent is quite
16 significant. A diesel bus in somewhere around 95
17 percent. This is for new technology in the case
18 of hydrogen application.

19 In looking at miles per gallon
20 equivalent, we doubled what it is for a diesel
21 bus, a 30 foot diesel bus. That to us is very
22 promising with a great future that we are
23 anticipating.

24 We are also part of the DOE Light Duty
25 Demonstration Technology Validation effort, and we

1 will be operating ten of these Hyundai Tuscon fuel
2 cell vehicles along with our buses.

3 Two years ago, we opened the Richmond
4 Hydrogen Station using electrolysis. The
5 challenge here is being able to produce enough
6 hydrogen utilizing non-grid power. Ultimately,
7 that is our goal, but for the moment we use power
8 from the grid, and the cost of that power is not
9 cheap.

10 Kilogram of fuel is around \$9 to \$10 per
11 kilogram in terms of production costs. That is
12 very expensive. If you recognize that a kilogram
13 of hydrogen is about equivalent to a gallon of
14 gasoline in terms of energy value.

15 We have launched our partnership with
16 Chevron Texaco. We are building a large on-site
17 reformer. Large for our needs, but very small in
18 terms of the technology of reforming hydrogen from
19 methane.

20 We are attempting to achieve the DOE
21 standards of bringing the cost per kilogram down
22 below \$4 per kilogram, which then begins to look
23 much more affordable in terms of the hydrogen
24 production needs.

25 Chevron Texaco, I know it is a large oil

1 company. There is some skepticism about oil
2 companies and their interest in hydrogen. We can
3 say from our experience, that our work with at
4 least a dozen participants at Chevron Texaco and
5 engineers on the technology side is that there is
6 a huge commitment and belief that hydrogen has a
7 lot of potential yet to be proven, but these
8 demonstrations are critical to making that program
9 a valid program for the future.

10 I think there is clearly a desire to
11 develop this a long a commercial path. The
12 advantage of starting with reforming as a first
13 step in terms of cost is very important and has
14 been recognized by the National Academy of
15 Engineering.

16 We are advertising our program. Chevron
17 has made a big pitch about what we are doing as a
18 partnership with them in DOE. Of course, we are a
19 part of the governor's Hydrogen Highway
20 initiative.

21 There is a long line in lead time to
22 develop this technology, and what we are looking
23 at is really going to be more than beyond 2010 to
24 address this car regulation that requires at least
25 15 percent of our new purchases in our fleet to be

1 zero emission vehicles.

2 We have yet to see how reliable and
3 durable this technology is and how well it works
4 with our first set of vehicles. I think we are
5 looking at somewhere between 10 and maybe even 15
6 years to make this commercially viable, to bring
7 that \$3 million per vehicle down closer to a more
8 affordable price, less than a million dollars.

9 In the interim, we have taken measures
10 to utilize ultra-low sulphur fuels, and after
11 treatment traps to clean up the air emissions.
12 This does not address the energy issues, but we
13 are very interested in hybrids and hybrid
14 technologies.

15 As a matter of addressing not only
16 energy issues, but also air emission and also
17 noise issues within our communities.

18 We recently launched a program to build
19 a fleet of gasoline hybrids using the ISE
20 technology, and we will be actually introducing
21 our first vehicle, our prototype vehicle later in
22 the fall of 2005.

23 We also developed our fuel cell bus such
24 that we can utilize a hydrogen ICE engine in that
25 same package. We are hoping to be able to raise

1 funds in order to develop this technology. I know
2 there has been a bus that was recently inaugurated
3 at Sun Line Transit, hydrogen ICE hybrid bus,
4 using the ICE technology. We have the same
5 desire.

6 If you look at these numbers and
7 comparing the different costs, the capital costs,
8 the most critical I think important numbers to
9 look at are the cost of a trolley bus in San
10 Francisco is now over \$800,000, that does not
11 include all the infrastructure, the overhead
12 infrastructure to operate those vehicles.

13 In Boston, the cost of a new trolley bus
14 is in excess of a million dollars. We are looking
15 at a hydrogen ICE hybrid bus at being less than a
16 million dollars, so it begins to look very
17 attractive from a capital cost. We still have to
18 prove the reliability and the durability and the
19 life cycle cost of these vehicles.

20 In terms of public policy, in order to
21 sustain our program, public transit has to place
22 service before technology. The fact remains that
23 if the bus or the transit vehicle that you are
24 waiting for is late and gets you to work late, you
25 don't really care whether it is a hydrogen

1 vehicle, a zero emission vehicle, or a low
2 emission vehicle, you are just upset with the
3 public transit agency for being late. So, that is
4 our first priority.

5 Government is needed in order to help
6 support us financially, to help us working towards
7 reducing the development gap, but also in a
8 continuing stream of funding so that we hope
9 \$800,000 vehicle, which is competitive with
10 trolley buses and with other technology, is still
11 far more expensive than the diesel bus that we are
12 buying today. It will be resources from the
13 government, from the state, and we hope the
14 federal government that is going to help us bridge
15 that cost gap so we can introduce these better
16 technologies that really provide significant
17 improvement to our local communities.

18 Our website is a way to track what we
19 are doing with our program. With that, I will
20 entertain any questions you might have as follow
21 up.

22 PRESIDING MEMBER GEESMAN: What are the
23 different vintages of your fleet, how old are your
24 oldest buses?

25 MR. LEVIN: The average age is somewhere

1 around six years for a fleet of 700 vehicles. Our
2 oldest buses, our 30 foot buses, that are now 14
3 years old, and approaching 15 years. With our new
4 procurement of small 30 foot buses, we will be
5 retiring those vehicles and using some of the
6 gasoline hybrid buses to retire those older
7 vehicles.

8 PRESIDING MEMBER GEESMAN: In terms of
9 your existing fleet, what would you see as the
10 likely life expectancy of one of your vehicles?

11 MR. LEVIN: The economic life governed
12 by the federal government is twelve years, but our
13 newest fleet of diesel buses that we introduced
14 into service in the last two years, retired 20
15 year old diesel buses.

16 PRESIDING MEMBER GEESMAN: I notice it
17 doesn't look as if you have purchased natural gas
18 vehicles.

19 MR. LEVIN: No, we have not. In part
20 because of the issues related to efficiency, the
21 capital costs, the maintenance costs, and frankly
22 the advances on the diesel side in terms of
23 emission while still achieving very good savings
24 on the energy side has in the past very reluctant.

25 We see the ultimate solution towards

1 zero emission technology and the hybrid technology
2 is going to be a perfect bridge between those two,
3 between where we are at now and what we are doing
4 with diesel technology, and where we would like to
5 be with zero emission.

6 PRESIDING MEMBER GEESMAN: I certainly
7 want to thank you for staying on the cutting edge
8 for as long as your district has been. It is an
9 important point of instruction for not just state
10 government but I think other transit systems
11 around the country.

12 COMMISSIONER PFANNENSTIEL: Question.
13 Do you see that the greatest benefit from the new
14 technologies would be for the neighborhood buses
15 or across the Bay Bridge buses, the longer haul?

16 MR. LEVIN: I think even though we
17 operate across the Bay express buses, all those
18 buses operate in dense neighborhoods. We pick up
19 people within a quarter of a mile of their
20 residence. So, all of these are these different
21 fleets that we operate. I think that it is
22 important that we can reduce their emissions
23 significantly to improve the quality of life in
24 these dense neighborhoods.

25 Those trans-bay buses operate through

1 very densely populated neighborhoods.

2 COMMISSIONER PFANNENSTIEL: Thank you.

3 PRESIDING MEMBER GEESMAN: Thanks very
4 much, Jamie.

5 Reza Navai. I hope I pronounced that
6 right.

7 MR. NAVAI: One good thing about my
8 name, Commissioner Geesman, was no matter how you
9 pronounce it, I know what it is.

10 Actually, I am pleasantly surprised to
11 find my name among the speakers this afternoon
12 because I was just thinking I am observing this
13 afternoon.

14 Never the less and maybe it is a
15 Christmas present by the staff -- let me make a
16 very brief remarks while I am here. As
17 undoubtedly the future transportation,
18 California's future transportation and energy
19 future, are very closely linked as demonstrated by
20 prior speakers.

21 We certainly appreciate a close working
22 relationship with the Commission, the support
23 Commission staff technical analysis, and we are
24 prepared to continue closely work with the
25 Commission staff to further analyze and evaluate

1 VMT reduction measures and options.

2 As you may know, BTH Secretary, Sunne
3 McPeak, has placed a special emphasis on land use
4 planning which is one of the measures being
5 considered in your report. Increasingly, land use
6 planning is becoming a critical element of our
7 transportation analysis, modeling, and
8 (indiscernible) effort.

9 Also, you may be pleased to know that
10 energy itself has more prominently in our
11 strategic objectives. Actually, one of the five
12 strategic objectives or 5E as we call it, is
13 energy which guiding our transportation documents
14 planning and investment decision making.

15 Cal Trans has a keen interest in energy
16 and working closely with the Commission staff to
17 explore implication of transportation issues and
18 further evaluating petroleum reduction measures,
19 including the methods of VMT reductions.

20 During the next few months, we look
21 forward to working with the Commission staff to
22 share our thoughts and thinking and be able to
23 provide input and during the development of the
24 Integrated Energy Plan.

25 PRESIDING MEMBER GEESMAN: Thank you

1 very much Mr. Navai. I would also say that
2 Secretary McPeak brings a welcome new perspective
3 to these tasks. Her emphasis on land use
4 considerations and the role that she has played in
5 energy matters for the state I think will serve to
6 bring all of us quite a bit closer together as we
7 try to address these challenges going forward.

8 MR. NAVAII: Absolutely.

9 PRESIDING MEMBER GEESMAN: The next
10 speaker is Ben Ovshinsky.

11 MR. OVSHINSKY: Thank you. Ben
12 Ovshinsky from ECD Ovonics, West Coast
13 representative. I'll take about six and a half
14 minutes of your time, and I should keep you awake
15 I think.

16 First of all, Ovonics is the inventor of
17 probably chronologically the first enabler of a
18 hydrogen economy, and that is in the form of the
19 nickel metal hydride batteries, otherwise known in
20 Japan as nickel hydrogen batteries, where we put
21 the hydrogen into the batteries and store the
22 electricity.

23 Secondly, the Ovonics is the inventor of
24 probably the ultimate enabling technology for a
25 hydrogen economy, and that is safe solid metal

1 hydride storage taking off from the battery
2 technology with different alloys.

3 Thirdly, our photovoltaics technology
4 starts and completes the renewables loop which is
5 the vision for a hydrogen economy.

6 Today I just want to give you a few
7 heads ups on a vehicle pathway, hydrogen vehicle
8 pathway that I think in all likelihood will enable
9 a practical hydrogen highway, way ahead of fuel
10 cell vehicles.

11 So, here is what I would like to say.
12 There is a widely held belief in the hydrogen
13 highway circles in this state in particular that
14 the default hydrogen powered vehicle is a fuel
15 cell vehicle. That such vehicles will be
16 available in high volumes in a reasonable time
17 period.

18 It is beginning to be appreciated at
19 least at the advisory panel level and the hydrogen
20 highway process in this state that fuel cell
21 vehicles may be decades away before they can if
22 ever show up in affordable reliable truly mass
23 produced volumes.

24 Through my involvement in the California
25 Hydrogen Highway process, I have come to

1 appreciate the huge cost in technology development
2 barriers that must be overcome to put even 10,000
3 or 20,000 of these fuel cell vehicles on the road
4 by 2020 at estimated incremental costs of
5 approximately \$300,000 per vehicles at those
6 volumes in that time line. Not even 1,000 fuel
7 cell vehicles can be expected by 2010.

8 Let's look at the other major pathway to
9 the Hydrogen Highway, which is the hydrogen
10 internal combustion engine vehicle, otherwise
11 known as a hydrogen ICE is how I will refer to it.

12 Compared to fuel cell vehicles, hydrogen
13 ICE's offer many advantages. One, they offer
14 nearly all the societal benefits of a fuel cell
15 vehicle, but are far more likely to appear in
16 volume much sooner. They are much easier and less
17 disruptive to manufacture in terms of stranding
18 OEM current investments. They are more
19 accessible, affordable, reliable, and ownership
20 and operation transparent to drive and maintain.

21 They are much more here and now
22 technology. A recent survey of OEM's showed that
23 incremental cost for a hydrogen ICE to be in the
24 order of 4,000 percent less than a fuel cell
25 vehicle.

1 Hydrogen ICE's can either stand alone in
2 the future as they develop in the market, co-exist
3 in parallel, or be considered a transition to a
4 fuel cell vehicle if and when fuel cell vehicles
5 arrive.

6 Hydrogen ICE's can provide near term
7 public demonstration, acceptance, and utilization
8 of hydrogen, thereby initiating immediate increase
9 demand, production, consumption of hydrogen, and
10 breaking the chicken and egg conundrum that
11 plagues the hydrogen economy concept nationwide.

12 The big heads up here is this, that
13 paradoxically, the hydrogen ICE pathway is
14 actually powerfully enabled by hybridizing the
15 vehicle. Hybridization of almost any vehicle or
16 fuel pathway delivers improvements and all
17 societal benefits, environmental emissions,
18 greenhouse gas performance, transportation energy
19 security and independence, as well as increase
20 vehicle driveability performance. You have heard
21 that attested to by numerous speakers, including
22 when you plug it in as well to amplify that
23 hybridization benefit. These vehicles can also be
24 plugged in.

25 When hybridization is applied to

1 hydrogen ICE's an even more efficient accessible
2 vehicle is created when you hybridize the ICE.

3 It is quite likely that the first
4 significant volumes of hydrogen ICE vehicles will
5 be hydrogen ICE hybrids, just as we are seeing
6 that with gasoline cars now. The gasoline hybrid
7 like the Prius is really ramping up in
8 accessibility and compellingness. I think the same
9 thing will be seen when you hybridize hydrogen
10 ICE's.

11 Incidentally, I don't think this is news
12 to anyone, it shouldn't be that most fuel cell
13 vehicles will be hybrids. Steve Chaulk attested
14 to that the last Advisory Panel meeting. The
15 major heads up I am getting to is where we come in
16 as much as anything is hydrogen storage.

17 Unfortunately, it is understood by very
18 few in my experience that hydrogen storage is the
19 critical factor that allows a viable hydrogen
20 economy.

21 It is not widely appreciated in hydrogen
22 highway circles that a number of fuel cell vehicle
23 OEM's have already effectively ruled out
24 compressed and liquid hydrogen storage as a basis
25 for commercially viable hydrogen vehicles and high

1 volume mass market production.

2 It needs to be understood that both of
3 those storage pathways, liquid and compressed, are
4 essentially used to demonstrate hydrogen vehicles
5 and concepts as they have been for two or three
6 decades and probably will for another decade until
7 more suitable storage solutions appear.

8 What Ovonics has done is basically
9 create that suitable storage solution. We
10 developed solid metal hydrogen storage as an
11 extension of the metal hydride battery as a low
12 pressure safe convenient and affordable means of
13 storing hydrogen with sufficient volumetric
14 efficiency, i.e. high vehicle range thereby
15 enabling development of a practical hydrogen
16 highway or a hydrogen-fuel economy.

17 Let me quote Goldman Abas Nazri from
18 General Motors RND Center, a very short quote,
19 "While hydrogen can be stored as a compressed gas
20 or in liquid form, these methods do not have a
21 high enough energy density along with other
22 issues, and long term solutions are built on
23 solids."

24 I want to bring you my concluding point.
25 I want to bring your attention to the Ovonic Metal

1 Hydride Hydrogen ICE Hybrid. It is a mouthful,
2 but basically think of a Prius running on
3 hydrogen, and that is it.

4 Ovonics in partnership with Quanum and
5 helped by South Coast funding has developed a
6 metal hydride ICE hybrid on the Prius platform.
7 This vehicle is a straightforward conversion of a
8 Toyota Prius which is a here and now in production
9 highly efficient high quality proven platform with
10 already great societal benefits that is easily
11 married to hydrogen it turns out.

12 The hydrogen conversion aspect of the
13 vehicle has proven technology. The vehicle in its
14 drive train is left intact. We usually convert
15 the gasoline ICE to run on hydrogen, we turbo
16 charge it, and replace the gasoline tank with an
17 Ovonic metal hydride tank.

18 The volumetric storage density is
19 exceptional. The current metal hydride storage on
20 the 2002 Prius, and we are now doing six 2004
21 Prius' for South Coast, holds three times the
22 kilograms of hydrogen as a 5,000 pound high-
23 pressure system in equivalent sized tank. This
24 translate directly to vehicle range.

25 Ovonic low pressure metal hydride

1 storage is safe, fast fueling, and low pressure.

2 The first iteration of this vehicle in a Prius
3 mode, the prototype driving range is already 140
4 miles. The second iteration now being developed
5 and will be delivered between 200 and 250 miles
6 conservatively. The average mile per gallon
7 equivalent fuel economy is even slightly better
8 than a gasoline Prius at this point.

9 The first generation prototype satisfies
10 and beats all sulev and pzev emission standards
11 and also beats nearly all gasoline Prius
12 emissions.

13 The tail pipe greenhouse gas CO2
14 emissions are near zero, an astonishing 99 percent
15 reduction at the vehicle compared to the gasoline
16 Prius, 3.2 grams per mile versus 223. That 3.2 is
17 largely lubricational oil that hasn't been handled
18 yet engineering wise.

19 Low pressure metal hydride storage is
20 ideally suited to accept hydrogen directly from a
21 electrolyzers and home fueling therefore becomes
22 quite viable.

23 One disadvantage we acknowledge, the
24 current iteration systems are relatively heavy.
25 However, both the metal hydride alloy and the

1 vehicle system engineering are under continuous
2 development to keep improving performance in all
3 respects including weight.

4 So, final point. An Ovonic metal
5 hydride ICE hybrid is imminently and inherently
6 and I will say incredibly more affordable than a
7 fuel cell vehicle. Estimated prices in production
8 would be in the range of auto makers near luxury
9 and top line SUV conventional ICE vehicles
10 compared with up to \$1 million for a fuel cell
11 vehicle at this time frame. We are talking about
12 the same time frames. I am talking near term.

13 This impressive hydrogen ICE hybrid
14 technology can put significant numbers of here and
15 now practical beneficial and affordable hydrogen
16 vehicles in a hydrogen highway near term well
17 before 2010.

18 Serious automotive industry exists to
19 manufacture this type of vehicle. That is my
20 comments. Thank you very much.

21 PRESIDING MEMBER GEESMAN: You said the
22 battery was heavier --

23 MR. OVSHINSKY: Not the battery, the
24 metal hydride tank.

25 PRESIDING MEMBER GEESMAN: Oh, okay.

1 MR. OVSHINSKY: The battery is the same
2 battery, the same Ovonic nickel metal hydride
3 battery technology that is in the Prius already.
4 That doesn't change. Of course, if you want to
5 plug it in and there is some serious -- I will say
6 there is some serious industry interest to also
7 plug in this hydrogen ICE hybrid, ala Andy Frank,
8 and then depending if you want 20, 40, 50 miles of
9 all electric range in that battery. As your
10 question much earlier, that battery would increase
11 in weight, size, volume proportionately.

12 Andy didn't make this point. If you are
13 talking about plugging in hybrids per say, whether
14 it is to a hydrogen vehicle or a gasoline vehicle,
15 basically, it is proportionate to range, but the
16 rule of thumb is from 20 miles to 60 miles all
17 electric range, you are talking about between a
18 1/6 to a 1/2 reduction in the battery size,
19 volume, cost, and weight compared to a comparable
20 full EV.

21 Any other questions, and thank you for
22 your consideration.

23 PRESIDING MEMBER GEESMAN: Thank you
24 very much.

25 The next speaker is Steve Heckerth.

1 MR. FONG: I am sorry, Mr. Heckerroth had
2 to leave.

3 PRESIDING MEMBER GEESMAN: Then the last
4 blue card that I have is Steve Welstand.

5 MR. WELSTAND: I am with Chevron/Texaco,
6 and I just had a few comments, a few technical
7 items, and then a couple thoughts about your on-
8 going process.

9 First of all, on Gary Bemis'
10 presentation on hybrids, I wanted to suggest that
11 on the Escape comparison that you also add in the
12 4-cylinder version so you would have that direct
13 comparison because the hybrid Escape is also a 4-
14 cylinder.

15 Some things would be better or some
16 things would be worse, so just to get a better
17 look at that.

18 Another thing you need to consider with
19 hybrids is the CAFE ratings that EPA gives those
20 vehicles has been found to be over optimistic
21 relative to standard vehicles and need to be
22 discounted and taken into account.

23 The reason I want to make again, though,
24 I think in all of these things these concepts real
25 life demonstrations are really the hard data you

1 need. There has been a lot of theory we've seen
2 hydrogen fuel cell vehicles talked about now for a
3 number of years and some realities are coming out
4 of them.

5 The kind of demonstration program that
6 was just mentioned between ChevronTexaco and AC
7 Transit gets you those real hard, real life, on
8 the ground data, and I think that is your most
9 valuable useful information.

10 Just a point of clarification, I know
11 you were interested in indoor air pollution, and I
12 believe there is no real regulation for general
13 air pollution indoors. There's no authority.
14 OSHA does have standards for particular chemicals
15 in industrial settings. There are thresholds at
16 various levels, some substances are controlled
17 industrially, but at home, we have no controls.
18 The ARB is very cognoscente of that and have been
19 looking at that. I don't know exactly what they
20 are going to do about it, but they are aware of
21 it.

22 Tom, I had a comment for you. You
23 mentioned the aromatics as a driver of permeation.
24 I'm not sure that is really the answer. First of
25 all, the experiment that was done by the

1 coordinating research council compared several
2 fuels, one of which was the ethanol blend that
3 showed the increased permeation rate, and that was
4 strictly an ethanol addition with constant
5 aromatics level.

6 The Coordinating Research Council is
7 doing some further experiments to assess what kind
8 of driver the aromatics part is. So far, the data
9 really just -- you know, the ethanol addition gave
10 us greater permeation, and that is what we are
11 dealing with right now.

12 PRESIDING MEMBER GEESMAN: Who is the
13 Coordinating Research Council?

14 MR. WELSTAND: That is a long-term joint
15 auto oil industry program. It used to be 1/3
16 partner with the US EPA. It was originally
17 developed during WWII at the instigation of the
18 federal government to solve mutual problems
19 between the fuels, lubricant industry and the
20 transportation industry. So, they continue to
21 operate. It is a non-profit organization. All
22 their data, all their research is publicly
23 available. I think your staff is probably fairly
24 aware of these folks.

25 PRESIDING MEMBER GEESMAN: Is that the

1 source of the ARB study that was referenced
2 earlier?

3 MR. WELSTAND: Yes. The ARB was an
4 instigator of the study, and they were a partner
5 with the Coordinating Research Council and its
6 conduct.

7 PRESIDING MEMBER GEESMAN: Do you know,
8 has the study been published?

9 MR. WELSTAND: Yes, it is on their
10 website. If anybody is interested, it is
11 crcao.com I am pretty sure. I don't think it is
12 .org. By the way, if anybody is particularly
13 interested in the data or background on that and
14 the results, we can provide input. We have
15 communicated with the ARB on some aspects. Of
16 course, they were there and no very well
17 themselves and have done their own assessments.
18 If further information is needed, we will be glad
19 to.

20 PRESIDING MEMBER GEESMAN: I think that
21 would be quite helpful. I do envision us being
22 drawn into this area over the course of 2005
23 cycle. So, any additional background information
24 you can provide would be helpful.

25 MR. WELSTAND: I know staff, they know

1 me, so we know how to get a hold of each other.

2 PRESIDING MEMBER GEESMAN: Great.

3 MR. WELSTAND: I've really made my point
4 about demonstration programs in any venue because
5 we have watched very carefully as these
6 technologies have come along and always wonder
7 what is really happening and eventually data does
8 fall out. Sometimes you have to dig real hard,
9 and I know I talked to staff. They wished -- they
10 are always looking for those things.

11 One of my suggestions is as you go and
12 develop the report, further engagement has been
13 going on in the alternative fuels area with the
14 vehicle stuff would be good if as you produce your
15 work had further workshop engagement to draw
16 people out or to force them to reveal the results
17 they have at hand or at least some people can
18 point to data that are available. Sometimes it is
19 in the little nooks and crannies, but they are
20 there.

21 PRESIDING MEMBER GEESMAN: I think that
22 is generally our operating style. We try to get
23 as much out onto the public record as we can.

24 MR. WELSTAND: The last thing I would
25 say is I think you are going to utilize the ARB

1 well to wheels assessment. There were a number of
2 comments during the AB 1493 rule development. We
3 can work with staff, but we point to comments that
4 are there. There are issues around some of the
5 things that need to be understood just so you get
6 a good balance on what those assessments really
7 provide.

8 PRESIDING MEMBER GEESMAN: What items in
9 particular do you have in mind?

10 MR. WELSTAND: A couple come to mind is
11 some of the -- one of the assessments on fuel cell
12 vehicle and maybe electric vehicle energy use were
13 based on some limited data. Probably smaller cars
14 like the GM Impact and maybe some early estimates
15 with their electric use rates were. We think they
16 are actually higher and need to be accounted for.
17 I'm trying to remember what else there were in
18 that. Possibly some of the up stream emissions at
19 the production process. Those are the most
20 difficult to really get your hands around and
21 really get answers. Some of those may need some
22 further investigation.

23 One thing that we suggested is that the
24 Argon National Lab greet model is really the most
25 well respected model out there. That is a good

1 one to reference that generally everybody relies
2 on most everybody in the business. So, I would
3 look at that as a cross check.

4 PRESIDING MEMBER GEESMAN: Okay.

5 MR. WELSTAND: Those are my comments.

6 PRESIDING MEMBER GEESMAN: Thank you
7 very much.

8 Do we have anybody else who cares to
9 address us?

10 (No response.)

11 PRESIDING MEMBER GEESMAN: Anybody on
12 the telephone?

13 (No response.)

14 PRESIDING MEMBER GEESMAN: Very well.
15 It has been a nice meaty day. We will be back.
16 This is really the beginning of our cycle. We've
17 got a lot of work ahead of us, and I certainly
18 want to thank all of you for sitting through the
19 presentations today and participating where you
20 have. I certainly want to encourage your written
21 comments as well as your on-going participation in
22 our process.

23 Again, thank you very much. We will be
24 adjourned. (Whereupon, at 4:17 p.m., the workshop
25 was adjourned.)

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